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CONTENTS

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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter							Second Quarter							Third Quarter							Fourth Quarter						
JANUARY							APRIL							JULY							OCTOBER						
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* YEAR-END DAY, December Y or 31, an extra Saturday, follows December 30th every year.
** LEAP-YEAR DAY, June L or 31, another extra Saturday, follows June 30th in leap years.

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a *"perpetual"* calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Each month has 26 weekdays.

In order to make the calendar perpetual, at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap year, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y or 31 and June L or 31, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays when approved by their respective authorities. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made with a minimum of disturbance.

"Our stability is but balance."—Robert Bridges.

For more than 35 years Louis J. Taber has given his time and energy to the development of the National Grange, an organization of 800,000 farmers, divided among 8,000 active subsidiary Granges. He has been Master of the National Grange since 1923, and is today the spokesman for farmers and the leading agricultural figure in America.

Born at Mount Pleasant, Ohio, in 1878, Mr. Taber was educated at Olney College. He had taken over the management of the Taber farm at the age of 14, when his father died, specializing in dairying and later branching into landscape gardening. He still owns the farm, where he engages in dairy and general farming operations.

Always active in farm organization, Mr. Taber helped to organize his own local Grange, then became Master of the Ohio State Grange, and is now serving his 15th year as head of the national organization.

Louis John Taber

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ELISABETH ACHELIS, *President*

VOL. 8 MARCH, 1938 No. 1

FARMER AND HIS CALENDAR

By LOUIS J. TABER

Master, The National Grange

TIME and the measurement of time have always been important to the farmer. From the beginnings of agriculture, thousands of years ago and on up until the present day, he has been a watcher of the seasons, a reader of signs that would tell him what day was propitious for sowing, what for reaping. Father Time is usually depicted with a scythe or sickle in hand—both of which are implements of agriculture.

The first calendars, it is but natural, were devised by farmers and that which governs our days and weeks and months now—imperfect as it is—was designed with an eye on the needs of the farming populace, their necessity of knowing with some exactitude the arrival and passing of the seasons.

To this day Swedish peasants reckon from the hour of the potato harvest; and in Korea on the other side of the world they do it from the ripening of the cucumbers.

Long before the coming of the white man, our own American Indians had developed crude calendars or methods of counting the passage of days to help them in their primitive agriculture. When the spring rains fell, the chief or the medicine man gave each member of the tribe five bundles of sticks each holding thirty—and each day they removed a stick. They had learned that the number thirty corresponded exactly to the days between the new moons. The Canadian tribes named the months Wild

Goose Moon, Frost Moon, Strawberry Moon, Red Raspberry Moon and Huckleberry Moon.

In the Upper Missouri Valley, the Indians applied long names to the months, descriptive titles which are self-explanatory: Corn is Planted, Corn is Gathered, etc. The Choctaws and Chickasaws, dwelling farther South, had their Watermelon Moon and their Peach Moon among others. And Hiawatha sang delightfully of a Crow Moon, a Hunger Moon, a Harvest Moon and a Long Night Moon.

These primitive month names, associating the calendar with agricultural processes, are to be found in all parts of the world. The Chaldean or Babylonian name for what corresponds to our March and April was *Itu-Su-Es-Sa* meaning, I am informed by P. W. Wilson, author of the "Romance of the Calendar," the time for using irrigation machinery. And July and August was *Se-Gur-Kud,* the time for the barley harvest.

The ancient Japanese, starting with what now is February, called their months such poetic names as Rise of Spring, Rain Water, Awakening of Insects, Vernal Equinox, Clear and Bright, Cereal Rain, Rise of Summer, Little Filling, Grain in the Ear, etc. In the South Seas on the Friendly Islands, the Tonga tribesmen whose chief crop is yams, name their months accordingly and we have such charming appellations as Little Yams, Putting Forth Shoots, Laying Earth, Storing Yams, Full Leafiness—each the name of a month corresponding roughly to one of our own.

In China, Jerusalem, India and wherever man put his hand to the plow or tossed seed into the earth, you will find these names of the months, familiar and useful to farmers. As recently as 1793, we find the French, fresh from their revolution, borrowing from the Dutch a calendar concerned with the passage of time in the rural countryside. Thus March was Ventose or windy month; April was Germinal or budding month; May was Floreal or flowery month; June was Prairial or meadows month; July was Messidor or harvest month.

There have been thousands of calendars in the course of history—calendars of twenty-four months, months of from five to sixty days. But all of them have paid tribute to the farmer. And the farmer in turn has treasured them and used them to guide him in his seasonal occupations of planting, cultivating, bug chasing and harvesting. However, I have yet to find one wholly satisfied with the existing method of calculating the seasons.

Organization, education and research have made the modern farmer unwilling to continue to do his job in a haphazard or hit-and-miss fashion. Neither is he willing to get his planting and seasonal instructions from the old-fashioned almanac. Long ago, not only Grange members, but progressive farmers quit selecting dates for planting or harvesting by the light of the moon or the size of oak leaves, or similar methods. The coming

of science has affected rural problems and made the farmer more of a business man than ever before. He operates frequently on a triennial or quadrennial farm rotation plan. This will be dependent upon location, soil, type of crop and market conditions. The date of planting, the amount of fertilizer, the kind and quality of seed, and similar factors guide successful agriculture. Our information must come not from the old almanac, but from laboratories, experimental stations and universities.

There was a time when the tiller of the soil did not know whether he was gaining or losing money on his farm. Modern methods, cost accounting, bookkeeping and the machine age compelled correct information and sound methods. Proper measuring of time, a calendar that is as exact as modern science, will help the farmers of the future as much as it will the accountants, the statisticians or the business man. It is well occasionally to take our minds off of important legislation, depression and prosperity and think in terms of the long swing of the years and when we do this there comes a practical realization of the fact that "times and seasons" are more important to agriculture than to any other group.

The benefits of such planning do not accrue in one year but after several when comparisons and the fixing of relationships become possible. It is here where the present-day calendar fails the farmer. For, the March 21 of one year is never precisely the same as the next. It makes parallelism difficult, throws calculations out of line. Perhaps, this may not seem very important—but in a statistical job, such as the farmer does when he attempts to figure results over a five-year period, the discrepancies produced by an irregular calendar are annoying, fault-creating, and to my mind sufficient reason to warrant a change. A regularized calendar would, moreover, be valuable in fixing the dates for the seasonal duties he must perform.

Add to his special, professional tribulations the fact that the farmer suffers from the irregularity in the same way and almost to the same extent as city dwellers, and you have quite a case. Irregularity of school days, holidays, church festivals, bank procedure, etc., all affect him.

I am hardly expert enough to decide or even formulate a definite opinion at this time on what form a regularization of the calendar should take. However, I would like to see one which would render the making of comparisons simple and stable from month to month and year to year, which would fix the important holidays, such as, say, Easter, and would balance the year so that the quarters were at least identical, beginning and ending on the same day.

If this were accomplished, it would be all that any one could desire or expect of calendar reform. Too drastic a change would be sure to meet opposition both active and passive from the populace, for a calendar is so integral a part of every-day life, so intimate an institution, marking as it does birthdays, wedding anniversaries, great victories, religious festivals,

that to change it abruptly and sweepingly without wide, popular consent would be to invite a protest powerful enough to resemble revolution.

Mohammed, more fierce and more powerful a dictator than any we have today, attempted such a calendar change, ordaining one of 354 days. As someone has said, it turned the year into a clock that lost regularly eleven days. It made difficult the figuring of the Spring for the Arab farmers; it angered them—these men who were more devout followers of their leader than any German or Italian today. It almost produced an uprising, and there are a few who attribute the decline of the Moslem Empire to this topsy-turvy form of reckoning the passage of time. One of the first acts of Mustapha Kemal upon assuming leadership of Turkey was to sweep aside the old calendar and substitute the one we use which, whatever its faults, was an improvement over the Mohammedan.

The long story of the adoption of our present calendar, with its unequal months and its irregular dates and seasons marks the story of blunders, mistakes and superstition. Science and astronomy have won victories in our present partially perfected calendar. Our challenge is to favor that development along the line that can be built on mathematical precision without any revolutionary approach. We need no startling change, but we should attack the needs of a modern world and seek to develop and work toward that type of a calendar that can have the support of all thinking people, but the interests of the open country must have large consideration.

INTERNATIONAL ACTION

Journal of the Royal Astronomical Society of Canada, Toronto

FIRST country to take up direct measures for reform of the calendar was Switzerland, which thus followed its tradition of working for international cooperation. The Swiss official proposals were initiated in 1913, but the World War disrupted plans for carrying them forward. After the war, however, the Swiss Government persuaded the League of Nations to take up the movement, and the League's offices in Geneva have been the center of the movement since 1923. After 10 years of investigation and promotion, the League submitted to all nations a draft treaty for the enactment of the reform. Switzerland meanwhile has carried out an intensive investigation and thus —as often before—proved itself a pioneer.

England, however, is the pioneer country in the campaign for a stabilized Easter.

The attitude of France, Germany, Italy and other nations is similar to that of England. In other words, international support is not lacking. North and South American nations are favorable, and so are Japan and China, in Asia.

Today's movement for calendar reform is a powerful influence for international peace. In the past, calendrical differences between peoples and races have repeatedly led to riots and even wars. Christendom was agitated for many centuries over the Easter date controversies. Pope Gregory's scientific revision of the calendar caused schisms which are not yet completely healed. Chinese emperors beheaded astronomers for calendrical inaccuracies; London cockneys rioted in 1752 in an effort to make the government give them back their eleven days; Turkey and other Mohammedan countries feared to abandon the moon-year until a very recent date; Russia vainly sought to confirm the Bolshevik revolution with revolutionary calendars of various types.

BEING ON THE SQUARE WITH TIME

Address Before the Board of Directors, General Federation of Women's Clubs, Washington, D. C., January 15, 1938

By ELISABETH ACHELIS

President, The World Calendar Association

FOR the forthcoming triennial meeting of the General Federation of Women's Clubs in Kansas City, you have planned your program on "Education for Living." This seems to be a wise and progressive procedure toward finding better ways to improve our present mode of living, for without education, improvement is ever difficult of achievement. In this program the reform of the calendar properly has its place. You will recall that at the Tulsa Council meeting last spring, Mrs. Latham was named a committee of one to investigate the subject of The World Calendar. An intensive study has been made which has aroused a nation-wide interest among women. Calendar reform, therefore, is not entirely new to many of you here today.

I think you will agree that the calendar is no longer functioning on the square with us, neither are we living on the square with the calendar. We are increasingly irritated at the unreasonable irregularities existing in the length of months and at the great inequalities found among the quarter and half-year divisions. We never know from year to year on what weekday the new year begins and the holidays fall. In a word, we desire, and rightly so, that the calendar be more on the square with time.

To improve the calendar, then, we have taken the quarterly divisions of the year as the foundation stones around which the new calendar is built. The equal-quarter arrangement is the key or guide to the new calendar, similar to a plan in starting on a new journey into strange territory. Looking at the large chart hanging on the wall, you will easily notice that the new World Calendar is squarely based on the equal-quarter divisions of the year. It retains the familiar 12 months, and divides these into four equal quarters with each quarter containing 3 months. The lengths of the months are more equally arranged, however, than in our present Gregorian calendar where, you remember, they contain from 28 to 31 days, making months and quarters of unequal length. In the new World Calendar the first of the 3 months in every quarter has 31 days, the remaining two 30 days each, and, what is equally important, every month has exactly 26 weekdays. Every one of the four quarters, then, is of like length and begins on Sunday. New Year, too, will always come on Sunday which, since it is the first day of the week and as such begins the week, would seem to be the only logical beginning-day of the year. Thus our

calendar is being equalized and stabilized, thereby becoming a fitting companion to our other standard time-piece, the clock.

We find, however, that the total number of days in the four equal quarters adds up only to 364, whereas the calendar must have 365 days in ordinary years and 366 in leap years. We cannot lightly disregard these one or two additional days, as they are vitally important to the calendar if it is to be stabilized and at the same time conform to the solar year with its four seasons.

The new World Calendar has ably taken care of these two days. The extra 365th day is added to the end of every year, after the completion of the fourth quarter. This extra day is called Year-End Day, descriptive of the day itself, and is considered a double or extra Saturday, recommended to be observed as an international holiday throughout the world. The 366th day on another Saturday, appearing in leap years only, is called Leap-Year Day and follows the completed second quarter at the end of June. It is likewise to be observed as an international holiday. By this method the calendar upholds the balance whereby the two half-divisions of the year are as closely alike as possible.

In this equal-quarter basis of the new World Calendar an amazing analogy is found with that of the new city of Jerusalem described by St. John in Revelation. You will remember that he says, it "lieth four-square" and "had a wall great and high and had twelve gates." The story continues to specify three gates to the east, three to the north, three to the south, and three to the west. We read that these gates are never closed and nations walk in "glory and honor" within this four-square city. A tree of life also grows therein which "bare twelve manner of fruits and yielded her fruit every month: and the leaves of the tree were for the healing of the nations."

The two days, Year-End Day and Leap-Year Day of the new World Calendar, recurring through the cycles of time, might well be compared to the leaves of the tree which heal nations and peoples. For these days, being international holidays, are living symbols of world cooperation and world amity. The four-quarter division of the new calendar, so analogous to the four-squareness of the new city just described, has a greater and deeper significance than might be imagined at first. Our very earth itself is created on a four-fold plan.

Familiar to us all is the expression "the four corners of the earth." Coincidentally, the much-used and important word "news" (north, east, west, south) might be said to signify the four directions to and from which report comes and spreads. It is hardly necessary to observe that these are the four cardinal points of the compass which indicate the four winds. The four seasons, too, are of vital importance to life on earth, and we all experience and automatically accept the recurring seasons with the annual

awakening spring, the flowering summer, the harvesting autumn and the dormant winter. In fact, these four seasons are the four cornerstones upon which the year is founded, and these exert a far-reaching influence on our many activities and even upon life.

Among all these different forces it is notable to observe that each force recognizes a mutual cooperation, yet each has its own niche to fill, its own part to play. There exists a remarkable agreement among them all, for they recognize their individual fields, at the same time possessing a common unity. Any lengthening or weakening of any of these aspects of the four-fold system would destroy the perfect square, and lack of balance and of coordination would be the inevitable result, with confusion and inefficiency trailing in the wake. Clearly then, the four-square system is sound and logical.

The new World Calendar fully recognizes the equal importance of the day, the week and the month (all corresponding to one season) in its equal-quarter plan, and because of this complete fairness existing among these various divisions of time, harmony and order exist within this new perpetual World Calendar. Even our stabilized clock is a striking example of this plan in its hourly arrangement of 60 minutes, grouped into four equal quarters, which are further sub-divided into three sections (of 5 minutes each).

To the average woman, justice and squareness play an important part in her life, giving to each detail its full value. Perhaps this is true because of the need of being on the square with her immediate family, if her home is to be one of harmony and balance. For we all recognize that a woman's daily life is closely tied up with the family.

Now I like to think of the year as a happy family of time—consisting of the day, week, month, season, and quarter—all children of the year. These are active offspring, each laboring in its particular field, yet all coming home together at regular intervals for a happy reunion, four times a year. This could not be possible except with the new World Calendar based on the four-square principle.

In this family arrangement of time, the year like a wise parent shows no preferences for one child over another; the week is not favored at the expense of the month or the day at the sacrifice of the quarter. This happy arrangement does not exist in our present Gregorian calendar where one quarter has only 90 days, others 91 or 92, and one month has 28 days and others either 30 or 31. And these we can never remember without repeating the childish nursery rhyme: "Thirty days has September, April, June and November."

Wage-earners and salaried officials, using this new perpetual World Calendar, can bring home their pay envelopes or salaries either daily, by the week, the month, or the quarter divisions of the year. It matters not,

as these all come together on the last day of every quarter, greatly facilitating all manner of bookkeeping and cash accounts. The convenient method of twelve monthly bills is not changed.

In the business world and fields of statistics the same advantages are present and, in addition, records and tabulations are easily comparable between past and present years, which is not now the case.

In the preparing of annual club programs in which you are particularly engaged, a regulated and stabilized calendar such as we are discussing today would be of untold assistance and advantage.

We are all interested in holidays. In the matter of holidays and anniversaries, we are very meticulous in preserving a definite date, month and year in remembering national and personal anniversaries at the same time that we strangely forget and completely ignore the day of the week on which they fell. The weekday is the poor Cinderella in our present Gregorian calendar. For example: The whole world was keenly interested in the recent coronation of the British King, George VI, and May 12th, 1937, will be remembered by many people in many parts of the world, although only the people of the British Empire will observe it. But not even most of the British will remember that it was a Wednesday or will realize that this anniversary cannot be regularly observed on the original weekday in our present Gregorian calendar. The same is true with our birthdays. For how many of us assembled here know whether they are Monday's child, fair of face or Tuesday's child, full of grace? It seems to us that the three-fold method of celebrating anniversaries is incomplete and that in the new perpetual World Calendar, based on the equal-quarter plan, every special event and any date will always fall on the same weekday as it did originally. Thus the four-fold method in our calendar time-unit, the weekday, date, month, and year, will be equally remembered and recorded in holidays, anniversaries and historical events.

I do not wish to take too much of your time by going into detail regarding every holiday, but I am certain many here will be interested to know that Lincoln's birthday, February 12th, will always fall on Sunday in the new World Calendar, and as is our American custom, be observed on Monday. George Washington's birthday, February 22nd, would fall on Wednesday. It is possible, however, to combine these two birthdays in one week-end, if the people so wish it, because February 11th was the original date of Washington's birth, but altered in 1752 by the Gregorian reform, when Washington was 20 years old, to February 22nd. February 11th, by falling automatically on a Saturday in this new calendar, would give us a lengthened week-end which might well be devoted to patriotic observances.

And then, there is Independence Day. Our busy men and women would perhaps welcome a respite in the middle of a hot mid-summer week by

observing this on July 4th, always a Wednesday, unless a Monday holiday is desired when, through legislation, it might be advanced by two days to Monday, July 2nd. This date also carries historical association because the Declaration of Independence was actually adopted by the Colonial Congress on July 2nd, 1776, but not officially issued until July 4th, and to obtain the necessary signatures took practically all summer.

As to Christmas, we know that it is primarily a day of deep religious and real family significance, although in recent years an ever-increasing note of secular merriment has entered into it. In the new World Calendar, Christmas, December 25th, will always come on Monday, leaving the day and evening of Sunday free for the holy observance of the Christmas spirit, singing carols and giving to Christmas a spiritual preparation. What a blessed boon a Sunday rest-day, after the Christmas business rush, would be for saleswomen, clerks, mail carriers and all others, whose labors are necessary to make the holiday successful and happy for the rest of us! No longer would Christmas be thrust into the business week quite lacking in spiritual preparation as it frequently is today.

By stabilizing our holidays, the arrangement of school and college vacations will be simplified and a greater opportunity will present itself whereby the family can be reunited for holiday vacations than is possible in our meandering calendar of today.

We cannot conclude any discussion of holidays without mentioning Easter. Demand for the stabilization of Easter comes from many walks of life. We believe in a permanent date for Easter but recognize that, while it affects economic and social conditions, it is *primarily* a religious question and one that must be dealt with by religious authorities—render unto God the things that are God's. Desirable as it is to have Easter stabilization at the same time as the reform of the civil calendar, the civil calendar can be reformed independently—render unto Caesar the things that are Caesar's.

Woman's opinion exerts a vital influence in present-day problems and, when once inspired and enlisted to endorse a cause, the success of that cause is more than half won. In joining with other organizations who realize the benefits a reformed calendar will have for them, the General Federation of Women's Clubs will greatly aid and stimulate the forming of an influential and constructive expression of opinion in favor of its adoption. This is the only way by which our government and others will be brought to realize the need for reform and the fact that people everywhere wish The World Calendar to be put into active operation. Among governments, 11 already approve this reform, the greater majority being those of the Latin-American states, our sister republics to the South. Shall we not do our part in bringing our own country in line?

Other organizations such as the National Education Association of

the United States as well as the World Federation of Education Associations advocate it. National scientific bodies, including the American Association for the Advancement of Science, have approved it, and many Chambers of Commerce, among them the New York State Chamber, have endorsed it. The American Statistical Association through an intensive study has proved that this type of reform has the support of a majority of statistical opinion. Labor, represented by the American Labor Conference in Santiago, Chile, in 1936, and the International Labour Office in Geneva, approved calendar reform because of the benefits to labor.

Whereas it is generally accepted that calendar reform is a civil matter and calls for civil legislation, it should be seen at the same time that this reform would bring real benefits to the clergy as well. We have, therefore, particularly invited their expression of opinion and cooperation. In this regard the international Universal Christian Council for Life and Work, representing the major Protestant and Eastern Orthodox groups, has endorsed a stabilized Easter provided it is based on the perpetual 12-month equal-quarter plan—The World Calendar. And the Roman Catholic Church has again and again declared that no dogmatic obstacle stands in the way.

A scholarly Rabbi, after giving this reform careful study and research, declared: "As the Bible may be man's human blueprint for divine goals, so the new World Calendar may be man's Chronicle of Time to achieve such goals through the leisure of a double Sabbath Day," and this double rest or recreational Saturday, the Year-End Day, is a feature of the new perpetual World Calendar.

When we have a time-system like this, actually planned on the four-square principle, it may help with other worthy reforms to bring us a fuller and more balanced way of living than we have ever enjoyed before. The new perpetual World Calendar may be only the first of many means to bring greater "glory and honor" to nations and exert a real effort to aid world peace and understanding among peoples throughout the earth.

OBITUARY NOTES

WILLIAM HENRY PICKERING, one of the leading American astronomers for more than 50 years, died on January 17, in Jamaica, W. I. For nearly a decade he had been interested in calendar reform.

EDWARD HOWARD HUTCHINSON, Buffalo banker and philanthropist, died on February 26. Long a member of the World Calendar Association, he urged the speedy adoption of The World Calendar.

OTHER deaths among the membership of The World Calendar Association during the past few months include: *Auguste Borgers*, President of the Ostend (Belgium) Chamber of Commerce; *Michael Foerster*, prominent Swiss poet; *Benny Dessau*, President of the United Breweries Ltd. of Tuborg, Denmark; *Dr. Edward L. Ehlers*, famous Danish physician; *E. W. von der Hude*, President of the Council, Copenhagen, Denmark; *Holger Rosman*, of the Chamber of Commerce of Stockholm.

IT ALL DEPENDS

By Prof. Wm. H. Barton, Jr.

Associate Curator of the Hayden Planetarium, New York City.

What is time as we know it in our practical affairs? Is it something fixed, absolute? Or is the clock, even when "correct," only a practical device for man's convenience? Is this Tuesday or Thursday, nine o'clock or four o'clock? It all depends upon the particular method of reckoning time. There are various methods which at different periods in the world's history have served man's practical needs. In this article, written for the *Sky* Magazine of the Hayden Planetarium, Prof. Barton traces the evolution of the calendar to its present form.

IT IS perhaps fortunate that most people accept the calendar as they do the sunrise. Its smooth operation, its apparent long standing and its practicability endow it with a divine sanction it does not deserve. In every home, and counting house, and public place one sees the familiar calendar pad. On every newspaper, every magazine and every book is a date. Every postmark, check, trolley or bus transfer records the date. Turn where you will and the date stares you in the face. The historian, the astronomer, the priest, and the man on the street would alike be helpless without the calendar.

Calendars are old, but the one we use is not. The calendar was an invention, just as important an invention as the automobile, or arithmetic, or the cultivation of cotton. Its present high state of perfection was reached only after many trials and much experimenting. Man's native awkwardness, and indifference, and ignorance retarded its development, but there it is.

The calendar was not as easy to invent as we might suppose. You cannot make an arbitrary calendar. It simply won't work. You can set up an arbitrary system of measuring length or capacity, or weight, and if you get those with whom you deal to agree with you (and even that is not easy!) the scheme is workable. But not so a calendar. A calendar has to fit in with celestial affairs. A calendar may be conceived on this earth, but it is governed from above.

The most obvious unit of measure is the day. The coming of the sun in the morning has always quickened man to activity. The animals, and man with them, demanded food. Hay was made while the sun shone, and when the sun reached the western skyline the day was done. Darkness, with its chill air and dampness, was the logical time for rest and a renewal of strength for the rigors of the coming day.

We have an insatiate desire to record events. We like to write history, and a part of history is the recording of dates. Robinson Crusoe whittling

notches in a stick presents a rather sad picture of a chronologist. The day is too short a yardstick to measure the scattered dates of the history known to civilized man. Early its weakness was seen. By whom and where is hard to say. But we can trace the earliest date in history.

Next to the daily motion of the sun across the sky and its reappearance in the morning, the moon's changing appearance was the most obvious measuring rod. About once in 29 days the moon is not visible in the sky. When it reappears as a narrow crescent in the western twilight at eventide it is a striking sight. It seems so fresh and clean and beautiful it was only natural that this "first appearance of the new moon" should begin a new period of time. An interval measured by the moon would naturally be a "moonth," or as we say a "month." Many early peoples recognized just such an interval, and with the blowing of trumpets the new month was heralded. In these early times the calendar was the priests'. Secret and sacred beyond the common herd, its mystery was guarded by ritual known only to the elect.

From our vantage point we can see the pitfalls these lunar calendar advocates were bound to fall into. We know today that the earth goes around the sun in 365 and about ¼ days. They did not. We know that the moon goes from new moon through its phases back to new again in about 29½ days. They did not. We can easily see that by no jockeying of our arithmetic can you make a certain number of these lunar months equal a year. Twelve such lunations is but 354 days and 13 such months gives an overrun of 18¼ days. A year with 13 months would be as unlucky as a hotel with a 13th floor. Twelve is a mystic number, a proper count for the year. Now see the trouble they had. Suppose we began a year with the first day of spring. The next year would begin on our lunar calendar about 11 days earlier. Three years would force New Year's Day a month ahead. And in about 16 years New Year's Day would come not at the beginning of spring but at the beginning of autumn. Another 16 years would restore the opening to spring. What a calendar! And yet today such a calendar is in use. The Mohammedans still have a lunar timepiece. The Hebrews had such a reckoning once but they soon discovered its weakness and inserted a month every three years to jerk the calendar back to its place in the sun. Such an extra month is called an embolismic month quite similar, in fact, to our leap-year day. And for the same purpose.

Chronologists also demand a starting point, a zero hour for their reckoning. Here each nation or religion sets a separate starting point. The Hebrews begin with a traditional date for the creation. Dates by this chronology are frequently identified by "AL." The "epoch" of this calendar is the year 3761 B.C. according to our dating. For instance, the year 5699 of the Jewish era begins at sunset September 25, 1938.

The Mohammedan epoch is the year of the Hegira or the flight of Mo-

hammed, or A.D. 622. Therefore the year 1357 of the era of the Hegira begins at sunset on March 2, 1938.

It was the Egyptians who discovered a better calendar. The Greeks, smart as they were, spent their energies on various ways of adjusting this lunar calendar. The Egyptians started fresh, on a new tack. They devised a calendar that is the basis of our own—except for slight adjustment *is* our own. In the clear skies of the land of the Pyramids the stars offered a means of measuring time,—the stars and the sun. Just as the moon disappears once a month when it is in the day sky with the sun so do the stars disappear once a year. The earth's annual trip around the sun is most evident to us by the sun's *apparent* yearly trip around the earth. In moving across the starfields it outshines the stars in its neighborhood and for a while they can be seen neither at sunset nor at sunrise. The brightest of all the stars is Sirius, the dog star. This was known to the early Egyptians as Sothis. In their clear skies it sparkled beautifully. When their priests could for the first time catch sight of Sothis coming up before the morning sun a new year was marked. In the year 2781 B.C. this event came just ahead of the rising of the Nile. This was the most important event in their year for it meant renewed fertility after the dangers of the flood were past. This "watch dog" then warned them of something their equable climate failed to tell them. Spring had come. Snow on distant and unknown mountains was melting to raise the river's level. Already the astronomers had counted the days of a year and to the best of their knowledge 365 made the count. The year as measured by the stars is really 365¼ days (our ordinary year). Therefore, Sothis would rise with the sun a day later after four years of such reckoning. This discrepancy was so small they at first did not notice its effect. When they did, no attempt was made to upset their otherwise smooth working calendar. But in four times 365 years, or 1460 years, the Egyptians lost a year. An improvement over the Mohammedans losing one every 33 years.

According to Breasted, one of our great calendar students, "a remark by Censorinus informs us that in A.D. 139 Sirius rose on New Year's Day; that is, New Year's Day in the civil calendar of Egypt once more coincided with the heliacal rising of Sirius. Bochardt has computed from astronomical calculations that the next earlier coincidence of this kind must have occurred in 1318 B.C., the next earlier in 2776, and a still earlier one in 4236 B.C. Archaeological considerations forbid us to suppose that we may push back still another such period of 1460 years." 4236 B.C. then is the earliest recorded date in history.

For more than 3500 years this calendar remained the exclusive possession of the Egyptians. Darius the Great attempted to introduce it into western Asia in the sixth century B.C., but the Greek fumblings with the lunar calendar were sufficiently impressive to keep it out. Politics, tradi-

tion, ignorance, and a certain inertia held it off. Meanwhile that slow slipping of the quarter day was learned of and the leak tightened up. Julius Caesar with all his faults clarified the Roman datekeeping. Roman chronology was reckoned from 753 B.C. This year "of the founding of the city" was the epoch. Dates are often marked A U C "anno urbis conditae." Nearly 500 years (509 B.C.) before Caesar's time, the Roman calendar had changed from a 10-month—304-day year to a lunar year of 354 days. They inserted 21 days every 2 years to keep it up with the sun. But so mixed up had the whole system become in 50 B.C. when Julius Caesar looked it over that he cut through the red tape in a rather ruthless way and straightened out the whole matter.

The magistrates who had charge of keeping the calendar in order had manipulated these intercalary months to their own advantage and to such an extent that the season festivals were much out of joint. The vernal equinox (March 21st to us) the beginning of spring was coming in December. Caesar called in a professional, Sosigenes, a Greek astronomer, educated in the Egyptian manner, who recommended that he (1) disregard the moon altogether and make the months alternately 30 and 31 days, with February 29. (2) Make the year 365 days and every fourth year put in an extra day accumulated from the neglected quarters each year. (3) Change the name of the fifth month from Quintilis to July (no doubt a play for Julius Caesar's favor). (4) Make one year 445 days to bring the vernal equinox back to March 25th. These recommendations Caesar put in effect by decree. The year 46 B.C. was that long year of adjustment called "the year of confusion" or the "last year of confusion." And in 45 B.C. the Julian calendar went into effect. So far it was the best calendar there had ever been.

Within the next 50 years Augustus muddled it up by changing around the number of days in certain months. It was Augustus or his pontiffs who further robbed the already short month of February of a day to make "his" month (already he had changed the name of the sixth month from Sextillus to August) as long as Julius' month. Oh, yes, and Julius had changed the beginning of the year from March 25th to January 1st. That is, the Julian calendar went into effect on January 1st, 709 A U C or as we say 45 B.C. That is why September, October, November and December are no longer, as their names imply, the seventh, eighth, ninth and tenth months.

Good as it was it was not right. Sosigenes did not know that the year is not 365.25 days long but 365.2422 days long! That is as you can figure out for yourself 11 minutes and 14 seconds too long. And now you think I am splitting hairs and getting professional! Not so. By 1600 the vernal equinox had moved up to March 12th. The calendar was 13 days wrong. By then better determinations had been made of the year length. Now Pope

Gregory took over calendar reform. Again he called in an astronomer,—one Clavius who proposed that the leap years be dropped out at the beginning of every century except every fourth century when they be restored. and that 10 days be dropped out of the calendar to bring the equinox to March 21st, where it would have been in 325 A.D. when the great church council was held at Nice. That makes the year 365.2425 days. Now it is only 26 seconds too long! By a new calendar recently adopted in Russia even that is taken care of.

In most Catholic countries the new Gregorian calendar was adopted immediately. October 4, 1582 was followed by October 15th. Ten days were thus dropped from the calendar. Most protestant and orthodox countries failed to follow the lead of the Roman Church. England and the Colonies kept the Julian reckoning, or "old style" as it was called, until 1752. By then the discrepancy was 11 days. But Wednesday, September 2, 1752 was followed by Thursday, September 14th. Other countries were even slower. Japan did not accept it until 1873, China 1912, Russia 1918, Roumania 1919 and Greece 1923.

Up until 1752, England began its year on March 25th but Julius Caesar's January 1st was then put into effect. This produced a rather curious incident. According to the family reckoning on February 11, 1731, a boy named George Washington was born. When he was a little over 20 years old, eleven days were dropped from the calendar, making his birthday February 22nd. But New Yew Year's Day was moved from March 25, 1752 to January 1, 1752. This moved February 1751 into 1752. Also moving George Washington's birth into 1732.

There are other things we might discuss,—the week, the names of the days, other methods of dividing the month, the meanings of the month's names and many curious calendars. But there is not space. Just one other simple method of reckoning time.

In 1582 Joseph Scaliger invented a simple scheme that very well satisfies the astronomer for a good many purposes. He merely counted the days since January 1, 4713 B.C. The number is called the Julian Day number. This does not refer to Julius Caesar but to Joseph's father. The date was not chosen arbitrarily but it marks the beginning of three important astronomical cycles, the Roman Indiction and the Solar and Lunar Cycles. But they make another story. Suffice it that this is a beautiful way of measuring long intervals and of changing dates from one calendar to another. In passing, February 1, 1938 is written J. D. 2,428,931. To make matters a little more interesting the Julian Day begins at noon, not at midnight.

Today then is many days on many time scales. Many tongues, many peoples, many religions, many traditions, many calendars.

YOU AND YOUR BIRTHDAY

By WILL IRWIN

This article was published in *Liberty* Magazine for February 19, 1938. The author, whose twenty-odd books are too well known to require mention, is honorary vice-president of the Authors League of America. He started his literary career in San Francisco about 1900 and came to the N. Y. *Sun* four years later and soon afterward became managing editor of *McClure's* Magazine. During the World War he represented the London *Daily Mail* at the front, and later the *Saturday Evening Post*. On America's entry into the war he became head of the foreign department of the United States Government's Committee on Public Information. He has been decorated by France, Belgium, Sweden and Lithuania. His Reminiscent Biography of Herbert Hoover was published in 1929. In the theatre, he is best known for his play "The Thirteenth Chair."

ROBERT LOUIS STEVENSON is the only man known to history who had no birthday. For Miss Ives, his little friend, was born on Christmas Day. While other children had parties and presents twice a year, she had them only once. Stevenson listened to her sorrows and in a humorously solemn proclamation ceded to her his own birthday, November 13, which she always celebrated.

One year from now, millions of world citizens born on the 31st of March, May, and August may row in the same boat with Stevenson. For the Christian world, together with the Orient, may be standing on the verge of a change in the calendar, and those dates may disappear. If this change—the first since the Christian era began—occurs, the person most responsible will be Miss Elisabeth Achelis, a native and resident of New York, who is not even listed in Who's Who!

It wasn't until she reached middle age that Elisabeth Achelis became interested in improving our imperfect method of clicking off the hours, days, months, and years. "Before that," she herself has remarked, "I led as uneventful a life as any woman could wish to avoid."

All four of her grandparents came to New York early in the past century from northern Germany. And not in the steerage. Both families brought money, social position, high connection abroad. Elisabeth Achelis was born and reared in an atmosphere that was cultivated, gracious, conservative, probably a little stuffy. The brain which she has since unveiled rated a higher education. But the ultraconservative set from whom she had sprung still held that attending college marked a girl as queer. So she ended her education in a young ladies' finishing school, made her debut, and passed on to a life of easy affluence on upper Fifth Avenue.

For years Miss Achelis was just a wealthy and leisured maiden lady who managed a fine house with a retinue of servants, trod a social round

among friends whom she had known since childhood, "kept up" with literature, current affairs, and the theater, did her part as a good churchwoman, and was active in such organizations as the League for Political Education.

In 1929 she found the clue by which she found herself. At Lake Placid she attended a lecture on a new thirteen-month calendar which George Eastman, the camera manufacturer, was just then trying to force upon the world. As the speaker pointed out the absurdities in our present method of reckoning time, they struck her forcibly. One year of 365 days—366 in leap year—cannot be divided into halves and quarters containing an equal number of working days. That makes much unnecessary work for statisticians; and more and more, in this modern world, statistics serve as the eyes of business. The Hebrew institution of the week, warped by the early Christians into the Julian scheme, goes its own sweet way, oblivious of months, so that any given date falls on Sunday this year, Monday next year, Tuesday the next. Then there is Easter.

Away back in 325 A. D. a church council adopted a complex formula based on the moon formula which the Hebrews used for determining the date of Pentecost, and made it a "movable festival." As a result, Easter varies, in various years, from March 22 to April 25. The other movable feasts, or holydays, like Ascension, Ash Wednesday, and Whitsunday, are calculated by their distance in time from Easter; and they shuttle back and forth with the same irregularity.

This peculiarity of Easter, the lecturer made plain, had become a special perplexity of business. The whole Christian world tends to buy its new and gay spring clothing to display at the glad festival of the Resurrection. The eccentric shifts of date disturb not only the garment trade but the seasonal labor behind it.

So far, Miss Achelis agreed with him. But when he came to Mr. Eastman's substitute, she found herself growing cool. The French philosopher Auguste Comte proposed this calendar nearly a century ago. It divides the year into thirteen months of twenty-eight days. Each day of each month would fall always on the same day of the week. Between June and July would come a new month, named from the sun—"Sol." That makes only 364 days. After December 28, however, would come a "Year-End Day," belonging to no day of the week. Every four years a "Leap-Year Day," similarly nondescript, would come between June and "Sol." And there would be a fixed Easter.

Several things were wrong with this picture so far as Miss Achelis was concerned. First, thirteen is about the oddest of all odd numbers. It cannot be halved or quartered. Yet everywhere, and especially in Europe, business uses half or quarter years as units for payments and statistics. She also found herself disliking that new, invented month, "Sol." And she believed that people in general would feel the same aversion. Further, she

knew the curious superstitious fear, old as history, of the number thirteen.

She might have dismissed the whole thing but for a brief communication which appeared just then in the New York *Times*. This writer also disliked the thirteen-month plan. But he proposed a substitute of unknown origin, proposed to the Vatican over a century ago. This, since called The World Calendar, retained the twelve-month scheme. The first month of every quarter would have thirty-one days; the other two, thirty days each. Each quarter year and half year would begin on Sunday and each would have an equal number of working days. It embraced a Year-End Day between December and January, and a Leap-Year Day between June and July; these were to be extra Saturdays. Any given date would fall on the same day of the week year after year. Christmas would always come on Monday. Finally, it proposed a fixed Easter. Going ahead of the story, the New World Calendar now adheres to the date of April 8. That is the best modern guess at the real anniversary of the Resurrection.

Suddenly Miss Achelis found herself an enthusiast on the subject. She spent her days in the Public Library studying the structure and history of calendars. It was perhaps characteristic of her at this period of her development that she first unloaded her ideas and purposes on her pastor. He saw nothing irreligious in calendar revision. Many clergymen of all faiths, he said, were girding against the idea of movable feasts. No layman could know what confusion they caused in liturgies. She laid the scheme before her lawyer. "Heavens!" he exclaimed. "What this would do to straighten out terms of court!" She called on the president of her bank. "Whoever thought of that calendar should have the blessing of every accountant!" he said. She tried it on business men among her friends. They liked the idea, unanimously. But no one was doing anything about it. Whereupon she made a decision. She would first blot George Eastman's thirteen-month calendar from the picture, and then do her best to cram this more sensible calendar down the throat of the world.

She knew enough to realize that the job would require a steady flow of funds for many years. So she revised her life, gave up her house with its cost of time and energy, moved into an apartment hotel, and set aside a substantial part of her capital as nucleus for an endowment fund. The result was a rather modest but assured income for an organization called The World Calendar Association.

She could block Eastman's plan only by showing that her own had important support. So, by personal contact and by circular, she began to pick off the officers of the body politic—"the big names." Thrown on the table before the League of Nations, these names would offset the endorsements Eastman had carried to Geneva. With each circular went an invitation to join The World Calendar Association at dues of nothing a year. These circulars were not dropped unopened into wastebaskets. The recipients joined in surprising numbers.

When the Committee on the Calendar met in Geneva in 1931, Miss Achelis made the opening address of the session. Logical, sensible, delivered with authority, it hit hard. The thirteen-month plan began to lose ground. The deep superstition against the number thirteen was still working, and no one seemed to like the idea of "Sol." By the time the League got ready for action, The World Calendar led the field.

Meantime the agitation had grown and spread. Miss Achelis made annual voyages to Europe at her own expense, inspiring and organizing World Calendar associations, maintaining touch with governments. On one tour she covered eleven countries between Turkey and England. A handsome woman with a fine aquiline countenance, gray hair, a humorous mouth, and clear direct blue eyes, she walks in on premiers, prelates and potentates with the air of an equal—and the world has a way of taking you at your own valuation. Above all, while advertising her cause she has taken the greatest care not to advertise herself—ego has wrecked many a reformer.

By 1935 so many world figures had become enthusiasts over the new calendar that open leadership passed, without protest on her part, from the hands of this selfless American woman. She is, however, still the quiet inspiration of the movement. Long before, she had made one of her most valuable converts in the influential Dr. I. Gajardo Reyes, astronomical expert of the Chilean navy. When last year the preliminaries were finished, it was Chile which put before the League of Nations a proposed treaty establishing The World Calendar, to take effect on January 1, 1939.

It is provided that the treaty shall not hold unless three-quarters of the nations in the League, plus the United States, decide to sign it. While the League is politically impotent just now, while Germany, Italy, and Japan have withdrawn, nations on the outside still cooperate with it on agreements which do not involve national interest. South America will probably vote for the proposal almost as a unit. Great Britain has been waiting impatiently for calendar reform. China, struggling along with an outdated "cycle" calendar, would have changed to our Occidental scheme years ago but for the imperfections of the Gregorian calendar. She will support this better plan. No other nation is, as a nation, openly unfavorable. Some of the powers involved can accept the treaty on the sole volition of a dictator; in others, it must run the gantlet of the national parliament.

If Miss Achelis and her associates succeed in stirring up public opinion before 1939, our government has two possible ways of dealing with an unprecedented situation. The administration, through the State Department, may accept the proposed international treaty and pass it up to the Senate for ratification. Some doubt whether this would make the change mandatory except for federal transactions, federal courts, and perhaps national banks. However, the rest of the nations will not endorse this proposal unless the churches fall into line. If they do, it seems a certainty that the American churches will follow. It would have, also, the general endorsement of our governing commercial bodies. And that would be enough. Or the administration may prefer an act of Congress.

The new calendar is coming; if not in 1939, then sometime. Should the European nations and the churches adopt it, we Americans must accept it eventually whether or not we like the change. And it is so much more convenient than our present system that after the period of readjustment we are bound to like it. Experts on international affairs rate the chances of the treaty as fair to good.* Of course this movement, in common with most other progressive causes, will be paralyzed if the world goes to war.

But if The World Calendar does win out this year, her triumph will leave a great void in the life of Elisabeth Achelis!

* Editor's Note: See Journal of Calendar Reform, October, 1937.

NATURAL BUSINESS YEAR

By WALTER MITCHELL, JR.

Research and Statistical Division of Dun and Bradstreet

ADVOCATES of calendar reform have long emphasized that any changes in the calendar must give prime consideration to the needs of business. Therefore the movement sponsored by business groups for what has been designated the "Natural Business Year" should be of interest to all students of calendar reform, because in several ways it bears upon that problem.

The concept of the natural business year simply stated, is that each line of industry or trade should close its books on a fiscal year timed to fit the natural seasonal cycle of that trade. For instance, the automobile industry, having changed its date for the annual showing of new models, finds that January 1st falls during a period of peak production and that the taking of inventories and the auditing of books would cause unnecessary interruption and confusion. The flour milling industry, having received its heavy shipments of wheat during the fall, is going at high speed when the close of the year approaches; and must continue to convert the wheat into flour both because of the limitations of grain elevator capacity and the need to convert the inventory investment back into cash as rapidly as possible to save interest charges.

From the viewpoint of accountants, any general adoption of fiscal closing dates on a sound business basis would be beneficial. Under present conditions, certified public accountants commonly work to the point of complete exhaustion during the first three months of every year and find their time largely idle during the remainder of the year. Some time ago, it seemed to members of the accounting profession that the community of interest made evident by these two sets of facts warranted a study of the possibility of arranging for fiscal closing dates which would be more convenient for all concerned.

The result was the organization of the Natural Business Year Council, sponsored by the American Institute of Accountants. It included representatives of the Robert Morris Associates, analysts of bank operating figures; the American Management Association, which deals with engineering and management problems in industry; the National Association of Cost Accountants and the credit reporting agencies.

This group held meetings for discussion and assembled a file of all previously published information pertinent to their problem. They found that adequate data were available for relatively few lines of industry and trade. They also found conflicts in recommendations—one authority recommend-

ing a certain closing date for a given industry and another advocating some other time. The Council endeavored to check all this information by questionnaires to trade associations and representatives of the industries concerned. It found the idea of a natural business year so little understood that complete and repeated explanations were needed before interest was evident in any industrial group. Even when interest was aroused in the abstract problem, more definite facts about the seasonal cycle of a given industry were necessary if the industry was to be convinced that a radical change was desirable from the traditional custom of closing the books with the calendar year.

At about this time the fertilizer industry, through its trade association, showed the way to future possibilities. It had conducted a study showing that the sales season for fertilizers was closed by the end of June even in the northern parts of the country, and that production for the following year's requirements did not start until some months later, even for the early season crops of the South. The Association therefore argued that June 30 should be the date for closing the books and learning the result of the season's business. Members of the industry finally agreed that this would be more advantageous than waiting for the end of the year to analyze results and report to stockholders. By association agreement, a large part of the industry—aggregating about 80 per cent of the dollar volume of production—shifted its fiscal year to June 30. This concerted change made it possible for the association to continue collecting aggregate figures and operating data without interruption and without the confusion which might have resulted if only a small percentage of the companies had shifted fiscal dates at any one time.

The Natural Business Year Council decided that reliable and authoritative data ought to be available to other industries, so that they could consider a similar move and a similarly satisfactory result. A general educational campaign was undertaken, and in addition, the Council requested the Research Division of Dun and Bradstreet to gather additional facts, so that any recommendation would bear careful scrutiny as to the prospect of a practical improvement.

Conference with the Council representatives found them in agreement with the view that industry would not be convinced of so radical a change in policy by a mere recommendation. It was decided therefore that bulletins would be issued, industry by industry, analyzing seasonal fluctuations in those financial factors which determine a natural business year.

Further discussion developed the conclusion that the following four items were significant in this connection:

1. *Sales volume.* No concern wants to occupy its clerks with the taking of inventory when they should be busy filling orders during a peak sale season.
2. *Inventories.* The taking of inventories should be easiest when they are small-

est, and under good management inventories are usually smallest when they are least needed for filling daily orders and making up assortments.

3. *Receivables.* The auditing of books is easiest when the number of open accounts is at a minimum, and the closing of books at a time when receivables are lowest should reveal to credit managers and to credit reporting agencies whether a concern's financial condition is shaky because of slack collection policy.

4. *Current liabilities.* Other things being equal, a small volume of current liabilities is a factor favorable to any concern's credit standing. Current liabilities, consisting of such things as bank borrowings and payables to suppliers, should be at a low point when inventories have been largely sold out and accounts receivable from those sales have been collected.

It was decided to write a series of bulletins around a standard pattern which would first discuss the seasonal fluctuations of the four significant factors so far as information could be obtained; which would then gather together any information about fiscal closing dates already in use within the industry, and about previous recommendations; which would thirdly suggest a closing date for future use and give reasons for that selection.

Bulletins have so far been issued for the following industries: Fur Coats and Fur Trimmings, Shoes, Cotton Textiles, Millinery. Other bulletins are now in preparation covering 14 additional industries. The bulletins are distributed to any interested persons, including complete sets to the important accounting firms.

A general explanation of the problem is issued with each bulletin, giving in addition to the history of the movement and its sponsorship, certain special comments and information. The position of Dun and Bradstreet is explained as follows: "In this research project the position of Dun and Bradstreet has been that of an impartial fact-finding agency only. The study has been undertaken because of the belief that a wider knowledge of the seasonal patterns of production, sales, inventories, receivables and liabilities will be helpful to management in various ways in addition to its specific bearing on the problems of the Natural Business Year. Promotion of the Natural Business Year as a concept and the development of plans for changing the fiscal closing date of any concern or industry are functions of the Natural Business Year Council. The recommendations regarding fiscal closing dates which appear at the end of each bulletin are the opinions and observations of the research staff of Dun and Bradstreet, based upon a study of the available facts, and after consultation with various individuals within the industry."

In selecting closing dates for recommendation to an industry, the end of a quarter year has been chosen wherever possible, so that concerns adopting the suggestion will be still able to compare their quarterly figures with other concerns or other lines of business operating on a calendar year, or closing their books on a fiscal year at the end of another quarter. From this standpoint the equal quarter-years which would result from adoption of The World Calendar should be an advantage, in that comparability by quarter-years would be more accurate than under the existing calendar.* At present accurate comparisons can only be made by

* These quarter-years close with Saturdays, March 30, June 30, September 30, and December 30; and begin with Sundays, January 1, April 1, July 1, and October 1. Each of these quarter-divisions contains 26 weekdays, 13 Sundays, 13 weeks, or 3 months, with one international holiday coming on an extra Saturday, December 31st, or December Y, every year, and another international holiday falling on another extra Saturday, June 31st, or June L, in leap years.

adjustment for the number of working days. This is inaccurate at best, and in any case is seldom used by business men, who lack both the method and time for making such calculations.

NATURAL YEAR FOR FARM MACHINERY MANUFACTURE

An example of the reports which have thus far been issued on the subject of natural fiscal closing dates is that prepared for manufacturers of agricultural equipment. The suggested closing date for the fiscal year in this case is October 31, and the report says in part:

SEASONAL VARIATIONS. Although no figures are available on the seasonal cycle of sales or shipments in this industry, the seasonal curve of employment and comments by various executives of the industry, in correspondence with the Natural Business Year Council, confirm the commonly accepted idea that production and sales concentrate heavily in the first four months in order to have implements in the hands of dealers ready for delivery to farmers at the start of the spring plowing and planting season. Two-thirds of the volume reaches retail dealers through manufacturers' branch warehouses, so that no great time-lag is involved in the wholesaling process. Although the seasonal cycle for various types of implements differs, and harvesters are sold in quantity later in the season than plows and harrows, sales and shipments appear to reach a low point at the end of August or September in the great majority of cases.

To some extent this industry shares with the automobile industry the problem that the finished goods are so bulky as to make the storage of a large inventory excessively expensive. However, inventories are built up to some extent during the fall and early winter months in preparation for peak shipments in late winter or early spring. Since the materials used are mainly of a nature which can be purchased currently as required, variations in raw material stock in the hands of manufacturers represent mainly speculative commitments of a non-seasonal nature. Thus, inventories as a whole probably reach their low point in the late summer or early fall.

A major proportion of the credit extended to the larger established dealers is collected within discount period. However, the need of manufacturers for broad distribution has required the carrying of small dealer accounts for a substantially longer period in towns or areas where the line otherwise would not be represented, and in the old South where country merchants commonly carry farmers' accounts around the year to the cotton picking season. It seems likely that receivables reach their lowest point some time in the fall, perhaps one or two months after the low point in sales volume.

A number of the established manufacturers have sufficient working capital so that the financing of seasonal inventories and receivables is reflected by a variation in cash and security holdings rather than variations in current liabilities. To the extent that seasonal working capital is acquired by borrowing, current liabilities would be on the increase during the fall and winter months, decreasing during the spring and summer to a low about the end of the summer.

PRESENT FISCAL YEAR. More than 25 per cent of the agricultural implement plants observe a fiscal year other than the calendar year. A tabulation of the closing dates of 13 manufacturers of farm machinery shows 6 concerns closing their books on December 31, one each at the end of April, June, August, September and November, and two concerns closing on October 31. The American Institute of Accountants reported in 1931 that many members of the industry had changed from a calendar year to August 31 or September 30 closing.

The International Harvester Company and Deere and Company close their books on October 31. Although correspondence shows that some plants and types of products reach their low point of inventory by May 31, and others do not reach the low point until late in the fall, October 31 seems the most suitable date, generally speaking, for closing the industry's fiscal year. (The Natural Business Year Council in 1935 recom-

mended September 30 as the closing date. In 1928 the American Institute of Accountants recommended a June closing.)

SUGGESTED CLOSING DATE. October 31, for the following reasons:

1. This date has been adopted by two of the large units in the industry.

2. Accounts closed on that date give a picture of the year's business as soon as possible after the close of the selling season and before costs of production of the next year's model have entered into the expense ledger.

3. Because of the long gradual decline of sales during the spring and summer months, receivables and current liabilities are likely to have reached their low point.

4. The suggested closing date need not constitute an objection to earlier fiscal closings by those members of the industry whose particular products make it desirable, and any general industry totals or averages could validly be assembled after the October 31st closing, even though some fiscal year figures represented earlier closings.

NATURAL BUSINESS YEAR FOR COTTON TEXTILES

SEASONAL VARIATIONS. Apparently because of the rapid movement of goods from textile weavers to dyers and finishers, the seasonal cycles of the two industries represented under the title "Cotton Textile Weaving and Finishing" are very nearly identical. Shipments reach their major annual peak in March, resulting in a considerable depletion of stocks, which are built up again during the slack shipping season in the summer. Secondary sales peak occurs in September for the cotton textile weavers and in October for the finishers. For both branches of the industry, stocks reach their lowest point in September or October and accumulate to high points twice a year, in June and December. Receivables reach their low point at the end of July or August. In the case of the cotton textile weaver, receivables dating from the heavy peak of shipments in March have not ordinarily been liquidated before the secondary peak of shipments occurring in May. During June and July when shipments are ordinarily low, collection of spring accounts can be cleared up before the peak of sales in the fall.

An August low in receivables is even more likely among the cotton textile finishers, who have no secondary peak of sales in May.

Disregarding speculative commitments of cotton, the current liabilities of cotton textile mills do not ordinarily fluctuate widely. The yearly cycle of operations consists mainly of conversions of inventories into receivables and back again into inventories approximately every six months.

PRESENT FISCAL YEAR. Convenience in taking inventory seems to have been a primary consideration among concerns which have adopted fiscal years other than the calendar year. It appears that 69 concerns, operating a total of 103 plants, close their books on dates other than December 31. These establishments represent 11½ per cent of the total number of 888 cotton textile weaving establishments covered by the Census. The closing dates used include January 31, March 31, April 30, May 30, June 30, July 31, August 31, September 30, October 31 and November 30. In a breakdown of these closing dates according to the 14 major products groups, it appears that the August 31 closing date has most frequently been adopted by plants making cotton duck, wide and narrow sheeting and similar goods. Makers of print cloth and color cotton goods have more commonly adopted September 30 as a closing date. The Natural Business Year Council in September, 1935, suggested July 31 as a closing date for this industry.

Our suggested closing date is September 30 with August 31 as an alternate. Reasons:

1. September 30 being the end of a calendar year quarter, fiscal closing on that date would permit easy comparison with other company statements and general business data commonly published quarterly.

2. Stocks are at a low point, facilitating inventory.

3. In those plants where heavy shipments during October would make it undesirable to tie up stock rooms for the taking of inventory and in those cases where inventory has reached low level by end of August, the August 31 closing would appear convenient.

HERE ALL NATIONS AGREE

By Erland Echlin

DURING a recent visit to Russia I had noted a general and intelligent interest in calendar reform on the part of many government leaders, particularly those who belong to the class of civil servants rather than politicians. Four different calendars are at present in simultaneous use in certain state offices, such as the foreign office.

A few months later, in Geneva, I found the Russian diplomats at the League of Nations fully agreed with representatives of the other world powers as to the desirability, in principle, of a revised calendar. This proved clearly, I think, that calendar reform is one of the few subjects upon which all the world can agree, without bias of national or international politics.

It was M. Litvinoff of Russia, in fact, who acted as *Rapporteur* for the League's Transit Commission in presenting the calendar reform recommendations of that Commission to the 96th Session of the League Council, January, 1937. His report was an endorsement of calendar reform, and represented the result of more than a decade of study and research within the League organization, resulting in the strong position of The World Calendar proposal today.

Of course, it is fair to say that M. Litvinoff, in presenting this report, was speaking neither as a representative of his government nor as a member of the Jewish people. He merely happened to be the spokesman selected for the honor of reading a document which was presumably the unanimous opinion of all League officials who have given the matter of calendar reform any serious study or consideration. But M. Litvinoff was for once in complete agreement with his colleagues, and this is somewhat unusual in an international body where many of the agendas provide item after item that is violently controversial. M. Litvinoff was delighted to advance the cause of The World Calendar as one subject that had a substantial measure of support among his listeners.

Some time after this formal report was read in Geneva, I was surprised to read in the London *Times* a communication from Chief Rabbi Hertz of England, in which he *viewed with anxiety* "the strong Soviet support of the calendar reform resolution at Geneva." Rabbi Hertz appears to have missed the significance of the fact that the real leadership at Geneva on behalf of Calendar reform came definitely from the Roman Catholic countries of Latin America, and that Russia's support of Chile in this matter was a happy augury for all friends of international peace and good will. "I am sure," said M. Litvinoff, "that my colleagues will appreciate the contribution of the Chilean Government to the solution of this question,

and I would suggest that the Chilean draft Convention be referred to the Commission on Communications and Transit, at the same time being brought to the notice of the Governments."

Though M. Litvinoff's words were formal and correct, neither supporting nor detracting from his subject, it can be imagined that few men are more aware of the need for a balanced World Calendar. For M. Litvinoff almost daily—in his capacity as Foreign Minister—uses four different calendars. Old Russian for computing events up to 1923; Five Day Russian from 1923 to 1931; present Six Day Russian; and, for his relations with the outside world, the existing Gregorian calendar.

When revolution fired Russia in 1917 the nation's calendar situation was a conflict between the Gregorian and the Julian systems. For six years the Soviet organized and consolidated its governmental system before it got round to changing almost the only remaining form that linked Russia to the world outside. Then it brought forth a calendar as new and untried as its social theories—with a 73-week year. Behind this new calendar was a genuine belief that it would be economically better. But popularly it was hailed by Communists as another slap at God—who had been "abolished." On October 26, 1923 (Revolution Day), by order of the Council of the People's Commissars the Soviet's "Eternal Calendar" was inaugurated. Five days to a week, six weeks to a month, plus five holidays with national instead of weekday names—January 9 (Peasant's Massacre, 1905); January 21 (Lenin's Deathday); May 1 (International Labor Day); October 26 (Revolution Day); November 7 (Kerensky Flight). Leap Year was taken care of by a quadrennial holiday, Industrialization Day.

This ambitious calendar, designed to increase production 15 per cent lasted but two years. During that time workers were issued yellow, pink, red, purple and green cards, each color representing the day that particular citizen had free in his staggered five-day week. In theory machines never stopped, relays of workers stood over them producing, producing. The short week—four days of work and one day of rest—was touted as Utopian, but examination quickly showed that the actual time free was a little less than one and a half days in seven—which meant that the Soviet worker toiled just a little longer than his brother in the capitalistic nations of the world outside.

But not because of this did the 73-week system break down. The state found that machines, too, needed rest—for repair, overhaul, adjustment. Workers complained that on their days off, their friends had to work. "Four days of the week my pals find I am not at home," was a characteristic comment, "and on the fifth day I find that they are not at home." Production was less for all the intense effort because men felt themselves machines, responsibility fell off, substitute management confused large

parts of the whole scheme. One thing the 73-week calendar did do—it made Russians first lose track of, then entirely forget the Sabbath.

This system was abolished December 1, 1931, when the present Soviet calendar was begun. Russia's Academy of Sciences, after long studies in which every known calendar was considered, struck what it thought was a happy medium. Chief bar to the adoption of any past or present world system was that all had either a Sunday or a definite "religious day"—something not to be tolerated in Stalin's state. The compromise calendar, complicated beyond belief, consists of a 12-month year with the same five holidays as before and the same extra day for Leap Year. Months have 30 days and the weeks end on the 6th, 12th, 18th, 24th and 30th. These days, holidays for machines and workers alike, ended citizens complaints, rested industrial equipment, still left Sunday where the state wanted it—outside and forgotten. Under this calendar, production again increased in 1936.

But over the vast Russian countryside the Soviet's 45,000,000 farmers, whether on "collective farms" or as "unliquidated" individuals, still sow, plow, reap and store according to the seasons of nature. In most districts these are the familiar four—Spring, Summer, Autumn, Winter—and laboriously has the peasant gone over his calendar of "numbers" to plan his work, and crudely mark in the old divisions. Shippers, advising foreign ports of delivery dates, compare Russian and outside calendars. At *Intourist* bureaus clerks figure, "You want to be in London by the 25th? . . . Let me see, this is the 10th in the U.S.S.R., in England it is the 8th. You should leave on the 18th, but that is a holiday here . . . etc." Quite often the harassed employees are wrong and generally they are annoyed by the extra work of two calendars. Journalists receiving news from abroad must not only translate the language but transpose dates as well. But really on the spot are archivists and historians who dip into all four calendars of the past twenty years to have their events fall upon understandable dates. And in that same fix is M. Litvinoff's Foreign Office. All through the building in downtown Moscow—once a department store—officials have two calendars, Soviet and the one we outsiders use, cheek by jowl on their desks.

This is Russia's current effort at "calendar reform." In Moscow I found that citizens, especially *Intourist*, regarded it as an almost unendurable nuisance,* but like other nuisances nothing will be done about it until State leadership takes it up. Then, you may be sure, Russia will fall in with whatever World Calendar the rest of mankind favors. Calendar reform is neither sectarian nor political. Efforts to tie it up with the highly controversial subjects of world politics smack strongly of the unscrupulous use of circumstance.

*Since days have no names, engagements are made for dates—for example, 2 P. M., March 16. Adults have forgotten the old weekday names; children have no idea there ever were such days or that they exist in other countries.

ABOLISH TIME'S TYRANNY

By CHARLES NORDMANN

Astronome de l'Observatoire de Paris

(From *The Tyranny of Time*, published 1925 by Hatchette, Paris)

NEXT to the pleasure of killing time, nothing pleases men so much as to dissect it into well-grouped sections. Hence their interest in the calendar. . . . Much is expected of the League of Nations for the reform of the calendar, and with good reason.

I can hear the amateur diplomatists of the "Café du Commerce" facetiously explaining that the League of Nations has many other fish to fry, and that economic, political, historical, and geographical questions are enough to absorb its attention to such an extent that no time will be left for questions of the almanac.

To this I should respectfully reply that if the reform of the calendar is not a vital matter, that is an excellent reason for putting it at once at the head of the agenda. History and psychology agree in showing that the great problems, the problems of the highest importance, which affect all the interests and raise all the passions, are the most difficult of all to settle. Only the small questions can be tackled with any chance of a successful solution. A country or a man who only tackles the biggest things would lose time and fail to solve any, and this is as sure in science and in metaphysics as it is in politics. But let us return to the calendar, which is closely bound up with these considerations.

The best proof of its appreciable importance is that Caesar himself, and afterwards one of the greatest popes, and after him the Convention, that other Caesar, deigned to devote their intelligence to its improvement. And when the English passed from the Julian to the Gregorian calendar and the date suddenly jumped from one quarter to the next, there was a riot among the people. Evil tongues say that some great ladies of the aristocracy had a hand in this, because the jump in the date affected their coquetry. I could give a thousand other proofs. But I shall confine myself to pointing out the defects of the present-day calendar, hoping that they are of such slight importance that their correction will not hurt or harass anybody, nor put too many interests or customs on the defensive.

All the drawbacks of the almanac, all the complications and irregularities of the various calendars used, proposed, or discarded are due to the fact that there is no common measure of the day, the lunar month, and the year. To put it more drastically: (a) There is no whole round number of days between two consecutive returns of the same season; (b) there is no whole round number of days between two consecutive returns of the same phase of the moon; and (c) there is no whole round number of lunar months in the year. The tropical year, which is the principal unit imposed by nature on our subdivision of time, contains in fact, as already stated, a fractional

number of days, amounting to 365.24219879. The time which elapses between two full moons, which is what determines the month, equals 29 days, 12 hours, 44 minutes, and 2.8 seconds, and is not contained a whole number of times in the year.

To speak only of the principal calendars still in use among so-called civilized peoples, it is sometimes the month and sometimes the year which preponderates, and different systems result. In the Jewish calendar and in the Mahomedan calendar, the lunar month is the important thing, and this is very natural, for in the East, where these systems originated, the seasons are but slightly marked, while the generally clear nights and the nomadic life endow the phases of the moon with importance. The Mahomedan calendar does not concern itself with the seasons. The year consists of 12 months of 29 or 30 days, and has sometimes 354 days, and sometimes 355. The beginning of the Mahomedan year, therefore, lags some ten days behind every year, and its New Year celebration passes through all our seasons. The Mahomedan year is shorter than ours, and when a Mussulman confesses to 36 years he is really 35. Hence our year 1924 corresponds to the year 1342 of the Hegira, although the "Flight" dates from 622 A. D., and only 1302 of our years have elapsed since. This is all very curious and little known, because few people think about it.

In the Jewish calendar, on the other hand, a jump is made every now and then, which makes the Jewish year, on the whole, equal to ours. A year of 13 months is occasionally introduced among the years of 12 lunar months.

The Coptic calendar need not be dealt with here, as it only interests a few sectarians. Otherwise the whole of Christendom employs one of two calendars in which the year is the essential thing and the month is secondary: the Julian calendar or the Gregorian calendar.

These two calendars only differ because in the former, used by the Orthodox Church, the three leap years are not suppressed in every four centuries, as Gregory XIII had ordained to bring the calendar into conformity with the true year. This results in a lagging of the Julian calendar, the year of which is too long. The lag now amounts to 13 days, and brings it about that the 1st of January 1925 of the Orthodox corresponds to our 14th of January 1925. We must remark, however, that the days of the week are the same in both calendars, because when Gregory XIII instituted his reform he left the week untouched. Sunday among us is also Sunday in Eastern Europe.

It should be remembered that the institution of the Julian calendar by Caesar at the suggestion of the astronomer Sosigenes, was based on the supposition that the year lasted exactly 365¼ days. In order to allow for this quarter, Caesar substituted every four years a year containing 366 days.

Now it follows from the figure given above that the true duration of the year is a little less than 365¼ days, the difference being 11 minutes and some seconds. The Gregorian calendar was instituted to allow for this small difference. When it accumulates it makes a whole day in 128 years, or a little over 3 days in 400 years. The mean Julian year was therefore too long. In the Gregorian calendar, therefore, three leap years are suppressed in every four centuries, these suppressions taking place in the century years whose first two figures are divided by four.

But the defects mentioned below, to which we must turn now, are common to both the Julian and Gregorian calendars. Thus every reform which would remedy them would benefit all Christendom.

The first inconvenience of these calendars is one which is not an intrinsic one. It is that they are not universal. A number of inconveniences of international intercourse, difficulties of correspondence, and of commercial and financial exchanges, result from this divergence, this multiplicity of calendars employed in the world. It is evident that the best way of persuading all States to adopt the same calendar would be to make the new calendar clearly superior to existing ones. This makes it desirable to examine the intrinsic faults of the Gregorian and Julian calendars first.

One of the most serious of these inconveniences is the variation of the date of Easter and the other movable feasts.

Recently the League of Nations, on the unanimous recommendation of a committee

appointed to investigate this matter, on which the Holy See and the Orthodox and Anglican Churches were represented, passed the following resolution: "Concerning the fixation of Easter and other more general questions, *from a strictly dogmatic point of view* the reform of the Gregorian calendars does not encounter any difficulties which may be considered insurmountable."

This resolution, the stilted language of which is greatly superior to its grammatical elegance, signifies, if I understand it rightly, that the so-called competent authorities would take a favorable view of the fixing of Eastertide.

This problem, a necessary condition of every reform of the calendar, affects some very venerable ecclesiastical prerogatives. Hence the adhesion of the religious authorities to the above resolution is very important.

According to the rules closely followed since the Nicene Council, Easter takes place every year on the first Sunday following the first full moon after the spring equinox. Since successive full moons fall on different days of the month, and these days differ for the same month from year to year, it follows that the annual date of Easter must vary considerably. Thus, in 1923, Easter fell on the 1st of April. In 1924 it fell on the 20th of April, three weeks later. This divergence can be even greater. In fact, according to the "computation," or the rule which enables us to calculate these dates in advance, Easter may fall anywhere between the 22nd of March and the 25th of April, a range of 35 days. The variation and mobility of Easter imposes grave and very numerous inconveniences on business, travel, tourist traffic, teaching, and agriculture. It has been shown that in certain countries trade loses millions when Easter falls in March.

These inconveniences are aggravated by the fact that the mobility of Easter involves that of many other festivals, notably that of Ash Wednesday, which, according to the computation, takes place 46 days before Easter, Ascension Day, which is 39 days later, and Whitsunday, which is 49 days after Easter. If all the feasts were movable and at constant distances from each other, this system, however inconvenient, would at least be consistent. But that is not the case, and Christmas, for instance, falls on a fixed date which has no relation to the moon. Thus the interval between Christmas and Easter, which should surely be constant, can vary by 35 days from one year to another. How can we admit that between the anniversaries of two important events in the life of Christ there should be such different numbers of days?

But this is not all. We shall show by a definite example that there is something artificial in these matters, even from the astronomical point of view. We have already mentioned that in 1924 Easter fell on the 20th of April. Now in 1924, the vernal equinox took place on the 20th of March at 21 hours, 20 minutes, 14 seconds. The first full moon after that equinox occurred on the following day, the 21st of March. Thus, according to the rules of the Nicene Council, Easter should have been celebrated on the following Sunday, the 23rd of March. But actually it was celebrated about a month later, owing to the fact that the vernal equinox has been fixed once for all for the 21st of March, which is not always astronomically true. The "moon" used in the computation is a theoretical moon, a fictitious and ideal moon, whose phases are retarded with respect to the real moon.

We must congratulate ourselves that the authorized representatives of the governments and religious organizations have declared that there is nothing in the way of ending this archaic complication, this chronological anarchy. We must now wait and see how much time it will require for this half-hearted resolution to become an accomplished fact.

Other defects of the present calendar are that the divisions of the year

(months, quarters, half-years) are of unequal length, which causes continual inconvenience and uncertainty, loss of time and money, errors and injustices in the calculation of salaries, interest, insurance and pensions, rents and annuities, and current accounts. The first half-year contains 2 or 3 days less than the second. Some months have 3 days more than others. The number of days in the quarters is 90, 91, and 92 respectively. One fact suffices to show why from the simple banking point of view a chronological reform is indispensable: In most European countries the inequality of the months has led financial establishments to base calculations of current accounts and deposit accounts on a year of 12 months of 30 days each, a total of 360 days, while no salaries but "discounts" are calculated on the actual number of days in the year. The fact that the months, quarters, and half-years do not contain an exact number of weeks produces a number of difficulties.

Furthermore, the date of the month does not fall on the same weekday in successive years. Periodical public and private events, anniversaries, maturities, fairs and markets, and meetings do not fall on the same weekday for a given day, and vice versa. The 1st, 15th, and 30th of a month is often a Sunday, to the great inconvenience of business men.

The fixed feasts are often inconvenient, falling on Sunday or in the middle of the week These drawbacks have led men, and particularly business men, to study the indispensable reform of these badly devised calendars, which cost immense sums and cause a thousand petty annoyances in the world.

Even before the war, international congresses assembled to popularize and study the question of reform. The most important of these took place at Liége on the eve of war. It passed the following resolutions:

(1) The International Congress for the reform of the calendar assembled at Liége on May 27, 28, and 29, 1914, considering the multiplicity of calendars in use at present, and the necessities of modern life, recommends the civil and religious authorities to adopt a new *universal* calendar.

(2) The Congress recommends that the new calendar be a *perpetual* one, with invariable agreement between days of the month and days of the week.

(3) Having considered the information and documents laid before it, the Congress sees no paramount obstacle, from the religious point of view, to placing one day out of date in ordinary years and two days in leap years.

(4) The Congress recommends that the year consist of 364 dated days, forming 52 whole weeks, plus the supplementary day in ordinary years and two supplementary days in leap years.

(5) The Congress recommends that the division of the year into 12 months be preserved.

(6) The Congress recommends that Easter be fixed for one of the first Sundays in April.

Obviously, the primordial drawback of the present calendars is that there are several of them. In Europe alone, the nations have three different chronological systems. The resulting inconveniences are similar to

those which existed when every town had its local time and the units of measurement varied from one province to the next.

The time has been fixed so that at a given physical moment or "epoch," as it is technically called by astronomers, all clocks in the same country indicate the same time, always supposing that they are well regulated.

The important thing was, not that every town should keep a perfect time, but that all should keep the same time. The best proof that the perfection and scientific provision of the official time is of only secondary importance in a domain where so much is conventional, is that the official time has recently been changed on a number of occasions without much inconvenience. The chief point was that the time should be uniform.

The same applies to the calendar, which is indeed nothing but a sort of classification or language. It is desirable that everybody should speak the same language, imperfect though it be.

This was forgotten by certain persons who formerly, and especially in Russia, opposed the unification of the calendars on the ground that the Julian calendar is, after all, not much worse than the Gregorian, and that the Slavs would not adopt the latter unless all its defects were remedied. That is the sort of ultra-revolutionary Utopism which, claiming to aim at nothing but ideal perfection, never obtains anything. "All or nothing" is a very bad principle even in matters of chronology. For as in all human affairs one can never have everything, we must resign ourselves to putting up with something less. It were better to have one calendar of average merit than two good calendars, not to speak of two mediocre calendars, just as in war a single chief is always superior to several, even though they be excellent ones.

I, therefore, consider that the League of Nations was right to enumerate, among the international arrangements it is preparing, the unification of all the calendars employed by the nations, which unification shall be realized by the adoption of the Gregorian calendar. This for many reasons, both theoretical and practical, as we shall see.

Certain defects of the Gregorian reform have been noticed for a long time past. Here is one of them. The mean duration of the real year is 11 minutes and 15 seconds shorter than the Julian year of 365 days, 6 hours. That difference of 11.15 minutes attains the value of a day in exactly 128 years, so that the Julian calendar loses a day after every 128 years. In suppressing three days in every four centuries, the Gregorian calendar therefore suppresses a day in every 133 years instead of 128. The small Gregorian error is not very considerable, since it only amounts to 3 hours every 400 years, or one day in eight times 400 years.

Yet it had to be pointed out, for one must never tamper with scientific accuracy. To rectify this slight error and prevent its effects from accumulating, some astronomer has put forward the following rule, which would neatly rectify the Gregorian calendar and could well be adopted by the League of Nations:

"The years divisible by 4 will be leap years, unless they are divisible by 128." Let us take, for instance, the year 1920. It is divisible by 128, with a quotient 15. This means that since the Christian era the Julian calendar has lost 15 days. But the difference between the Julian and Gregorian calendars is only 13 days, and that shows

another defect of the Gregorian reform. When Pope Gregory XIII proclaimed his reform in 1582 it was only dated back to the Council of Nicaea (A.D. 325) whereas it would have been more consistent to date it back to the beginning of the Christian era. The error accumulated by the Julian calendar in the course of those 325 years exists also in the Gregorian calendar, and amounts to two days. Logically, a small correction should be made, which would bring back the vernal equinox to the date on which it fell at the beginning of the Christian era.

This is all very well, but if we want to succeed we must for the present leave these scientific refinements on one side. We must first demand the unification of the calendars by the generalized adoption of the Gregorian calendar which the League of Nations could impose.

In spite of its minor defects, the Gregorian calendar is greatly superior to the Julian, which is a much slighter approximation to reality. But apart from scientific reasons, there are imperious practical reasons for the general adoption of the former.

The first of these is that the Gregorian calendar is at present used by a much larger number of people and nations than the Julian. The second is that the center of gravity of civilization is incontestably located among the nations using the Gregorian calendar. Finally and chiefly it is the course of events itself which, as we shall see, irresistibly impels the dissident nations towards the adoption of the Gregorian calendar, and of that alone.

China and Japan have recently adopted the Gregorian calendar officially, and Bulgaria has done the same since the outbreak of war, in 1915, to be precise, on the occasion of the visit of William II to Sofia. They had a curious reason for doing so. Since 1914, the Bulgars have blazoned it forth that they are not Slavs, hoping thus to explain their actions against their liberators, the Russians. It was in order to break a link with Russia that after the visit of the Kaiser following the crushing of Serbia the Bulgars solemnly and finally adopted the Gregorian calendar.

Thus the subjects of Ferdinand thought to give a positive proof of their intellectual rupture with their enemies. They forgot that they thus attached themselves not only to Germany, but to France, England, Italy and the United States, all the great nations which use the Gregorian chronology.

What is interesting about it is that the reform was accomplished in Bulgaria in the simplest manner, without any disturbance. No riot, not even a protest, marked this official ageing of a people by 13 days which fell upon it suddenly.

What was done without a shock in Bulgaria in war time seems, according to the latest information, to have taken place with similar smoothness in other Eastern countries, particularly in Yugoslavia. Rumania, Greece, and Turkey have done the same or are on the point of doing so. So has Russia.

People have understood at last that religion has nothing to do with these questions of the almanac, more especially since China and Japan, who are not Catholic in any sense, have officially adopted the Gregorian calendar.

The objections raised by certain Slavonic personalities that there would be resistance, and justifiable resistance, on the part of the Orthodox clergy, do not appear to be well founded, as we have seen.

And besides, it is a fact little known among us, that among the Orthodox who use the Julian calendar, the Church does not use the same method of measuring time as does the Julian calendar adopted by Orthodox governments. The Orthodox religious year begins in September, and not on the 1st of January, the official date. The years are not counted from the birth of Christ, so that the year A.D. 1919 is the year 7427 of the Orthodox Church.

Even the numerals used by that Church are neither Arabic numerals nor the Latin numerals we know. They are numerals derived from old Slavonic letters. And thus, while the public authorities adopted the Julian calendar, the Orthodox Church remained faithful to its particular chronological rules.

Religion and the calendar can therefore be, as mathematicians would say, "independent variables." Hence the official adoption of the Gregorian chronology by the Turks and the Orthodox Church can have no inconvenience.

To sum up, the general acceptance of the Gregorian calendar may and must be placed among the terms imposed upon the world by the League of Nations.

To subordinate this easy reform to the reconstruction of the whole mechanism of the calendar, of which I am about to speak, would be putting the cart before the horse, and running the risk of achieving nothing: *Qui trop embrasse, mal étreint.*

Having regulated this first point of practical importance, the League of Nations, discouraged, perhaps, in its laudable attempts to found an earthly Paradise, will perhaps tackle chronological reform more seriously. Here also it can be very useful, for many things are, unfortunately, to be corrected in the Gregorian calendar, which, at this point, has become the only calendar of civilized peoples.

There are, however, some matters under dispute, as we shall see, and these disputes must first be settled by a competent authority such as the Academy of Sciences or some other body which will examine them. The surest means of obtaining a result with the League of Nations is to present to it something which is technically complete.

Since the Gregorian reform, only one project of a reformed calendar has had a practical result, however ephemeral. It was the French Republican calendar. The glance we have already cast on its qualities and defects, will allow us to form a sane judgment of the reefs which must be avoided in chronological systems if they are not to be shipwrecked.

The reformed calendars now offered must take care to preserve as far as possible those names to which mankind has got accustomed. And they must not insist on absolute consistency. Names are of the greatest importance. Let us now pass the principal systems in review. I cannot describe them all, but only the categories in which they find a place. Besides, as it is not my business to discover and indicate the priorities of the various authors, I shall only mention some of them incidentally, without classification. Most of these systems have been put forward, or at least particularized, in the course of an interesting competition organized by the Astronomical Society of France. The prize was awarded to M. Armelin, who proposed that the year consist of 4 equal quarters of 91 days each (two months of 30 days and one of 31 days). This makes 364 days. To these, either one day or two supplementary days are added, accordingly as the year is an ordinary year or a leap year. These supplementary days are not dated. Thus, each quarter has 13 whole weeks, and in all the quarters the dates always correspond to the same days of a week in the quarter.

Many authors have put forward analogous projects, which are really variants of the above. They differ either in the manner in which the 30-day months follow the 31-day months—several combinations are possible—or in the day of the week falling on the first day of each quarter; or again by the place given to the supplementary day or days, which may be separate or consecutive, and placed at the end of one or other of the quarters. I need not enter on the details of the various combinations.

It is clear, also, that each of these points has its own importance, and that it is not a matter of indifference whether or not the first day of each quarter is a Monday; whether the 15th or 30th is a Sunday; whether the 31-day month is the first, second, or third month of the quarter; or whether the supplementary days, which are festivals, are in the middle or at the end of the year, and follow a Sunday or a weekday.

But all these discussions would lead us too far. These matters are, after all, of secondary importance, and it will be easy to examine them and come to an agreement.

In this system, or systems, the present inequality of quarters and half-years is suppressed, there is a whole number—and the same number—of weeks in each quar-

ter, and the same weekday always falls on corresponding days in each quarter, that is, on days three months apart. Most of the accustomed characteristics of the present calendar are preserved, while many drawbacks are remedied.

On the other hand, an American astronomer, Mr. Searle, has suggested that the years thus constituted should always have exactly 52 weeks, without a supplementary day, the latter being introduced every seventh year as a 53rd week. The Gregorian cycle of 400 years contains 20,871 weeks, which, with leap years, give 497 supplementary days, or 71 weeks, which could very simply be distributed periodically.

Then there is another group of reformed calendars. The best known of these is the Delaporte calendar. In this system, the year also consists of 364 dated days, plus one or two undated ones; but whereas in the previous system the quarter was the basis, it is now the week. The year consists of 13 months of 28 days each, making 364 days, and each month consists of exactly four weeks of seven days each. In this extremely logical and simple combination, the same day of the month always falls on the same day of the week, and the months have identical lengths. It is obvious that this calendar also comprises numerous variants according to the day which is to be the first of the month and the position of the supplementary days. The system is still more rigorous than the last one, but it also, by a natural consequence, contravenes old-established habits. Would the public admit a year of 13 months? It is not only a question of the superstition attached to the number 13, but also of the inconvenience and disorganization to commercial habits resulting from the suppression of convenient subdivisions like the quarter and half-year.

That seems to have been the view of the members of the Liége Congress, for the reformation of the calendar since among the resolutions passed there is the following: "That the division of the year into 12 months be preserved." Indeed, in reading through the resolutions of that interesting Liége Congress, we see that its tendency is towards the adoption of a system more or less analogous to the Armelin calendar. This I point out, without taking sides in the matter. *Adhuc sub judice lis est.*

Let us not seek an exaggerated scientific rigor in the reform of the calendar. That reform is demanded by practical considerations such as those which appealed to the Chambers of Commerce. The reform should be tackled practically. We must begin at the beginning, taking the easiest step first, which is the unification of the calendars in the Gregorian mould. *Chi va piano va sano.*

If we may be allowed to look at the matter theoretically, we see that all the difficulties, all the imperfections of the calendars proceed from the fact that the month and the week are not commensurable in the frame of the year. In other words, the synodic revolutions of the moon round the earth and the earth round the sun have no common measure.

One of the most singular errors of Plato, that divine dreamer, was to believe that natural things have only simple and perfect relations to each other. Thus, he sought to prove that there are only five perfect worlds because in geometry there are only five regular solid bodies.

Unfortunately, the truth is far otherwise. The real and profound harmonies of the world are not subject to the paltry limits of our logic. As Fresnel said: "Nature does not worry about analytical difficulties."

In any case, the fate of this question will enable us to judge the League of Nations. Some persons believe the League is the chrysalis whence a better future will emerge on the luminous wings of Justice and Liberty. Others hold it is but the last and fugitive reflection of the illusory clouds of the Past. But belief is not knowledge. The reform of the calendar will help us in choosing between the two points of view.

EVERY YEAR THE SAME

By GRACE T. HADLEY

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THINGS that people live by are work, play and our 355-year-old calendar. Most people go to work on Monday morning, work until Saturday noon, then speed somewhere for the weekly playtime. If Friday happens to be a holiday as was December 25, 1936, there is rejoicing, as it means a longer holiday, but when holiday dates vary, they play havoc in business and in school work.

Business firms, schools and colleges are beset by difficulties in making their annual calendar with due allowance for holidays. The defects of our present calendar are—that it is inconvenient, irregular and costly. A given year's calendar is duplicated only at rare intervals. Every year is different and no one can tell except by reference to future and often unavailable calendars, or by laborious reckoning, on what day of the week a future date will fall. Computation of future dates is made more difficult by lack of uniformity and orderly rotation in the length of the months. One month has 28 or 29 days, four months have 30 days, seven have 31. This results in varying quarters of the year.

Our calendar defects are accepted without much thought because the calendar has come to us hallowed by custom and hoary with age. We still regulate our work, play and lives by the Gregorian calendar, which had its 355th birthday October 15, 1937. It was in 1582 Pope Gregory decided to revise the Julian calendar and sought the advice of astronomers. To bring it up to date, he decreed that the day after October 4, 1582, should be October 15 instead of October 5.

This Gregorian calendar has served people for three and a half centuries, but it is not practical for us to regulate our days and doings by so ancient a calendar. This is an age of split seconds—when speed counts even to the half second. Can anything be done about it?

A great deal can be done to stabilize our calendar. Astronomers and students the world over have given thought to this important matter and a modern calendar has been evolved, balanced in structure, perpetual in form. The equal quarters consist of three months. The first month has 31 days, the remaining two have 30 days. These quarters contain 13 weeks or 91 days, of which 13 days are Sundays and 78 are weekdays. Each month has 26 weekdays.

The better to understand the need of a modern calendar, consider just a few facts of calendar history. The Egyptians had a sacred calendar in

which every day, almost every hour, had its special religious ceremony. This was especially true in regard to the last five days in the year and the occasional extra "leap day" which priests autocratically inserted in the calendar in order to keep it true with the seasonal recurrences. The Egyptians, as far back as 4236, B.C., had adopted a 12-month solar calendar, the months having exactly 30 days, but as these 30-day months totaled only 360 days, short of the necessary 365¼ days, these days were inserted as described above.

Pope Gregory's calendar, known as the Gregorian calendar, was a great contribution to the progress of the world. It was not perfect nor free from errors, in fact, it has many defects which need to be remedied, but it has given fairly good service for 355 years. It has traditions of deep meaning in the history and religions of the races, for priests were its founders and guardians as well as astronomers and mathematicians.

Now in these times of speed and progress, there is active agitation for calendar reform. This reform is admitted as necessary, but departures from the Gregorian calendar should not be too drastic. While many plans for the revision of the calendar have been offered, until The World Calendar was presented only one proposal had serious consideration. This was the 13-month plan, sometimes called the Eastman plan. The World Calendar promoters, believing this plan to be too extreme for national and international adoption, offer an improved 12-month plan, a reasonable plan in which the year is divided into equal quarters.

Effective leadership among business organizations on behalf of The World Calendar has been taken by the Chamber of Commerce of the State of New York, numbering among its members influential leaders in the industrial, commercial and financial world of America.

Dr. Ismael Gajardo Reyes, President of the Latin-American committee for calendar reform, made a tour of Latin-American countries for two purposes: First, to learn the official opinion of the leading South American Governments; second, to ascertain definitely the opinion of the Roman Catholic Church.

Dr. Reyes states: "On the latter point I was able to reach certain clear conclusions. One of these was that the Roman Catholic clergy in South America is not only informed and interested, but distinctly favorable to the adoption of a new calendar. All the clergy with whom I discussed the matter, in various parts of South America, were in favor of reforming the calendar on the basis of The World Calendar."

Under the forceful leadership of Bishop Manning, the Episcopal General Convention in October, 1934, passed a comprehensive resolution in favor of calendar reform and the stabilization of Easter, approving specifically the type of calendar known as The World Calendar.

Our present calendar needs revision and the 12-month World Calendar

is offered as a calendar balanced in structure, perpetual in form. Calendar revision would help to unify the nations of the world and bring about better international understanding. The World Calendar would require a minimum of adjustment, it would be the least costly and most convenient form of calendar revision.

Ancient calendars dealt with a sidereal year. The Accadian, Babylonian and Assyrian calendars dealt with a sidereal, not a tropical year. Ours is a tropical year, that is to say, according to the Julian calendar later corrected by Pope Gregory, our year is bound to the seasons and its months maintain a constant relation to the four great divisions of the ecliptic, the solstices and the equinoxes. The winter solstice falls about the 22d of December, the spring equinox on the 21st of March, the summer solstice on June 21, the autumnal equinox about September 23.

January (Lat. janua, a door) is the open door of the year, open to let in the lengthening daylight. The Romans had a deity, Janus, a man with two faces, one looking backwards, the other forwards, because he stood between the Old and the New Year. Thus, New Year's Day has a prominent place in our calendar and the custom of making presents was derived from the Romans.

February is a sturdy month looking forward to spring. Saxons called this month Sprout-kale, later on Sol-Monatt, signifying the return of the sun from his low course in the sky.

February is the month of birthdays of famous men in our history, Washington, Lincoln and Edison. Candlemas, the second, is a beautiful festival in Rome in many churches. Valentine's Day, the 14th, is a day beloved by children.

Heretofore, February has had a Leap-Year Day added to its usual 28 days every four years. In the perpetual calendar this additional 366th day in leap years is another extra Saturday between June 30 and July 1, and called Leap-Year Day.

March is Nature's old forester going through the woods, bidding the brooks to hurry along, dotting the hills with green, waking the wild flowers. Nature revives and we have our vernal or spring equinox. The Romans called this month Martius, the Saxons, Lenet-Monatt, because the days were longer, then equal with the night.

April, the grass month, is green on hills and in meadows. Fruit trees blossom. Easter is queen of the festivals, the other two are Christmas and Whitsuntide. The word Easter is said to be a Saxon word "Eostre"—the spring of the year. Easter is a great day, but it has a bad habit. It wanders from date to date. It is a movable feast; it moves backwards or forwards on the calendar accordingly as the full moon next after the vernal equinox falls nearer or farther from the equinox. Easter Day is always the first Sunday after the full moon which occurs upon or next after the 21st

day of March. The earliest date that Easter can happen is March 22, the latest is April 25. Between these two dates this great festival wanders back and forth, causing much inconvenience.

May is the flower month. The Romans had floral games this month. Arbor Day is one of the great American holidays to foster the planting, protection and preservation of trees and shrubs.

Whitsuntide is a great festival of the Church of England, celebrating the descent of the Holy Ghost upon the Apostles.

May 30 is Decoration Day, when we remember our dead and decorate the graves of those who have passed away. It is a memory-haunted holiday for grown-ups and they attend memorial services. Later they take the children to parks and it becomes an outdoor holiday for all.

Just where June gets its name we are not sure. It might be from the Latin Junius Brutus, but June is the month in which days get longer until on June 21 we have the longest day of the year and the shortest night. It is the summer solstice.

June 14 is Flag Day. The flag is the national emblem of our country and stirs our hearts because immortal honor is woven into its very fabric. The Star-Spangled Banner is our stirring national anthem.

June 24, Midsummer Day—the Nativity of St. John. Midsummer Eve in old England was filled with the mystery of the woods. People went forth and brought branches of trees to put over their doors. It was an adventure to go into the woods Midsummer Eve, as they might meet fays, elves or fairies making merry.

July—Saxons called it Hay Monath, mowing their hay harvest; also Mead Monath from the meads in full bloom. They gave the months simple names related to nature.

In the old Roman calendar the year began in March, so July was Quintilis. During Cæsar's lifetime, this name was dropped and the month called July in honor of Julius Cæsar.

July 4, Independence Day, is our great American holiday celebrated with games, sports, balls, fireworks and illumination. Pageants of our national history serve to make the Fourth of July a true festival and recall to mind great men of history, Washington, Adams, Jefferson, men who lived not unto themselves alone, but left a priceless heritage.

July is a vacation month. People think about going places, but first they must consult a calendar, find the date on which to start and arrange a tour to arrive at certain places on certain days and hours. All travel is based on a time-table and calendar.

August—Harvest Month, celebrated in Britain because of the grain harvest. In the Roman calendar this month had the name Sextilis, but Augustus, who was ruler, wanted a month named for him, since Caesar had July, so he mixed up the calendar to gratify his ambition. Our calen-

dar is very old. In 4236 B. C. Egypt had a 12-month calendar. When Caesar revised the Roman calendar, he got an Egyptian astronomer to help.

September is an autumn month laden with harvest riches. On the 23d the sun enters the sign of Libra and passes on south of the equator. This month had 31 days in the old Roman calendar, but Augustus took a day from it.

September 24 in good old English days was the Feast of the Ingathering or Festival of Harvest Home. If the crops were good, there was much rejoicing because it meant food to last through the winter. The grains that were last cut were piled high on a wagon called the Hock Cart and hauled to the barn while the reapers sang: "Hip Hip Harvest Home!"

October—in some of the old Saxon calendars this month is the figure of a farmer carrying a sack on his shoulders, sowing the winter grain. Autumn wanes and the face of Nature changes. It's a jolly month with holidays beloved by children.

Hallowe'en happens on the 31st when families gather about an open fire to celebrate Nutcrack Night. Burns' poem "Hallowe'en" pictures such a night. Robin Goodfellow cried aloud: "In every corner I will go and make good sport with a ho, ho, ho."

November was the ninth month of the old calendar. On the 22d the sun enters the sign of the Archer and cold shoots into the earth. The Saxons called it wind month because gales of wind were so prevalent at this time.

December, like the three preceding months, has the name it had in the old Roman calendar. It brings the shortest day and the longest night.

December 24 is Christmas Eve. The eves or vigils of the church festivals according to church rule were times of fasting and penance, but this custom has changed and they are now periods of mirth and jollity. Sir Walter Scott in *Marmion,* gives a very vivid picture of Christmas Eve:

"On Christmas Eve the bells were rung,
On Christmas Eve the mass was sung—"

December 25, Christmas Day, is one of the greatest festivals of the year. It is of special interest to children since it is connected with the Birth of Christ—glorious event because He is regarded by the churches as the mysterious link between Deity and Humanity. Two popular customs belong to Christmas, hanging up the mistletoe and burning the yule log. It is a season of good cheer and hospitality. In olden times it was considered particularly lucky when Christmas fell on a Sunday, which will happen this year.

ATTITUDE OF THE CHURCHES

By Brendan McManus

Assistant Secretary, Rational Calendar Association, London

FOR some years past proposals for calendar reform have occupied the attention of the Christian Churches. The leaders of such communions as the Orthodox Churches, the Anglican Church, and the Non-Conformist bodies have recognized the demand for reform which, for many practical reasons, is voiced in responsible business and scientific circles throughout the world. As that demand has been expressed notably in proposals for the stabilization of Easter and the Movable Feasts, it has been a matter of intimate concern to the Churches. This fact, for the Easter stabilization, has been universally conceded and the League of Nations and the secular Governments have decided that the initiative properly lies with the heads of the Churches.

The purpose of this memorandum is to give a summary of the action which has been taken by the Churches, other than the Roman Catholic Church, up to date. It will be noted that the great majority have expressed themselves in favor of reform. In fact, 82 Church bodies have, directly or indirectly, made pronouncements to this effect.

The most concrete expression of Christian opinion of an international character in favor of calendar reform is that which is provided in the resolution passed by the Universal Christian Council for Life and Work at their council meeting at Chamby (Switzerland) in August, 1936. The text of the resolution was as follows:

Whereas the Universal Christian Council at its Eisenach meeting in 1929 expressed its desire for a careful study of calendar reform and Easter Stabilization; and

Whereas the Council in 1932 instituted an intensive study of these subjects by its Research Department; and

Whereas these studies and reports from the Churches have shown that a reform of the calendar and the stabilization of Easter would, if carried through, receive the support of the overwhelming majority of the Churches, providing it is based upon the perpetual twelve-month, equal-quarter plan proposed by the League of Nations;

Therefore, be it resolved, that the Universal Christian Council instructs its Standing Committee on Calendar Reform to notify the Secretary-General of the League of Nations concerning the above report and to secure the most effective presentation of this action of the Churches at the forthcoming world conference on Calendar Reform and the stabilization of Easter, and finally,

That this Council asks the Churches to inform their respective Governments of this action and of their views with regard to the desirability of adopting the new calendar.

The Council is a clearing house for the exchange of ideas and experiences in the practical application of Christianity, and is the body most truly representative of the opinion of the non-Roman Christian Churches. The Swedish Archbishop Soderblom, who was the originator of the Coun-

cil in 1925, intended that it should consider especially the possibilities of unity in the life and work of the Churches. Its members comprise:

Eastern Orthodox Church.
Austrian Protestant Church.
Christian Missionary Church of Belgium.
United Church of Canada.
Federation of Protestant Churches in Czecho-Slovakia.
Lutheran Nationals: Denmark, Estonia, Finland, Latvia, Sweden, Iceland.
Evangelical Church Federation of France.
German Protestant Church Federation.
The Council of the Dutch Churches.
Reformed Church of Hungary.
Norwegian Church.
Protestant Churches in Poland.
Reformed Church in Rumania.
Swiss Protestant Church Federation.
Old Catholic Church.
Church of England.
English Presbyterians, Baptists and Congregationalists.
Church of Scotland.
Scotch Episcopalians, Congregationalists, Baptists, Methodists, United Original Sectarians and Reformed Presbyterians.
Irish Protestants (Church of Ireland and Presbyterians).
United States: Federal Council of Churches.

EASTERN ORTHODOX CHURCH.—Although the Orthodox Church has not yet made a collective pronouncement on the subject of calendar reform, its official attitude toward the reformers is very favorable. This attitude remains as defined in the report of a Special Commission appointed by the Holy Synod in 1919. The Commission reported as follows:

> We consider that a reform of the Julian Calendar, being unobjectionable on dogmatic or canonical grounds, might be carried out on condition that the change will take the form, not of adhesion to the Gregorian Calendar, but of the preparation of a new calendar, more scientifically accurate and not suffering from the defects of the two calendars now in use, Julian and Gregorian.

The Special Commission included Chrysostomos Papadopoulos (now Archbishop of Athens and still favorable to reform); Archbishop Germanos, Exarch of Western and Northern Europe and one of the most distinguished leaders of the Orthodox Church; and the late Professor Demetrius Eginitis, who was also the representative of the Oecumenical Patriarch on all international conferences on reform.

The Panorthodox Congress (in 1923) besides making adjustments in the Julian Calendar, also passed a resolution on general calendar reform. As the nearest approach to a united expression of the opinions of the Eastern Churches so far recorded, it is important:

> This Congress requests the Oecumenical Patriarchate, after previous agreement with the various Orthodox Churches, to signify to the League of Nations that the Church is quite prepared to accept the new calendar which is being devised, provided the same is accepted by all the Christian Churches. While the Orthodox Church would prefer

a calendar preserving the continuity of the week, it is nevertheless not bound by such a preference if the other Churches agree to the acceptance of a calendar involving interruption of this continuity. Moreover, if the common consent of the Christian Churches is obtained, the Orthodox Church is prepared to pronounce in favour of the stabilization of the festival of Easter on a day which must always be Sunday, but a desire is expressed that such an immovable Easter shall correspond to the actual Sunday of Our Lord's Resurrection, determined by scientific methods.

The Panorthodox Congress represented the whole of the Eastern Church with the exception of the Patriarchs of the Levant—Alexandria, Jerusalem, Antioch—who for reasons of domestic policy questioned the competency of the Congress to speak on behalf of the Orthodox Church.

From the Oecumenical Patriarch of Constantinople, the highest dignitary of the Orthodox Church, came in February, 1927, an official pronouncement in favor of calendar reform:

If our Church in unfavorable times such as were those of the 16th century, when calendar reform took place in the West, refrained from itself also correcting the errors of the Julian Calendar, and in general condemned the one-sided reform then carried out, such an attitude does not signify and cannot possibly imply a prohibition for all time of any change whatever in the calendar. No canonical prohibition exists, and whatever prohibition there may be is concerned not with the calendar in itself but with the safeguarding of the canonical decrees concerning Easter.

The Holy Synod of the Church of Greece in the same year issued an official communication to its followers in much the same terms.

The Eastern Orthodox Church has, in point of fact, expressed itself more positively than any other communion in (1) opposing any 13-month scheme of reform, and (2) in adopting the perpetual, twelve-month equal-quarter calendar.

This has been largely the work of Professor Demetrius Eginitis, who was appointed by Photios Maniatis, late Patriarch of Constantinople, to represent him in all matters of calendar reform. He represented the Orthodox Church on the special committee of the League of Nations in 1931, and his report to the Patriarch, which was printed in the official Church journal *Ortodoxia* and therefore had the official sanction, has come to be regarded as the expression of the considered opinion of the Orthodox Church on reform. The report, dated Paris, June 23, 1931, states:

(1) With regard to Easter stabilization, the general opinion has been expressed, especially by trade and industrial bodies, that this ought to be effected. Decision, however, must be left to the competent ecclesiastical authorities.

(2) With regard to general calendar reform, many plans have been submitted, of which three have been adjudged worthy of attention and study: (a) a plan to equalize the quarters without establishing a perpetual calendar; (b) a plan whereby each quarter has one month of 31 days and two months of 30 days, with one additional day each year (two in leap years) these two days to be outside the weekly sequence and without a weekday name; (c) a plan to divide the year into 13 months.

The two latter plans, in providing for days outside the weekday sequence, aim to make any given month-day fall always on the same weekday. The second plan makes every quarter identical, the third makes every month identical. The 13-month plan succeeds in making full equality of all the months and is doubtless theoretically more

complete from this viewpoint. *But at the same time it is very radical*; it introduces 13 months instead of 12 and the resulting number of months is no longer divisible into halves and quarters.

The 12-month, equal-quarter plan, on the other hand, gives a correspondence of month-days and weekdays in quarterly periods rather than monthly. But it does not upset the universal habit of the 12-month year; it does not affront existing customs. It introduces approximate equality of months and full equality of quarters; it provides a perpetual calendar, and it makes every quarter exactly similar in weekday sequence. Finally, it offers greater possibility of general acceptance than the 13-month plan.

Approval of the 12-month, equal-quarter plan and of the stabilization of Easter has been recently expressed by the Greek national committee, and this opinion will be supported by the representative of Greece at Geneva.

I, myself, as representative of the Church of Constantinople, supported the same opinion in the Committee at the League of Nations.

Several years later, in 1933, the Rational Calendar Association of London conferred with Archbishop Germanos and prepared a report of his observations which he approved. In this he indicated that there would be no opposition to reform among the Eastern Churches. His view of the question is expressed in the following passage from the report:

The twelve-month, equal-quarter plan which the representative of the Eastern Orthodox Church has supported in many international conferences seems an entirely logical and effective way of remedying every serious defect of the present calendar. From the viewpoint of the earnest churchman, it has important implications which go beyond its merits as an improved civil and business measuring rod.

For the calendar has a religious meaning, too, and a revised calendar will inevitably have an effect in unifying and stabilizing the church calendars of all the great communions.

The significance of the movement in its bearing on church unity is what has won for it the attention and support of church leaders.

CHURCHES IN THE UNITED STATES.—The most important move taken by the United States Churches toward calendar reform was the adoption by the General Convention of the Protestant Episcopal Church at Atlantic City on October 19, 1934, of the following resolution:

Whereas recent studies and inquiries, instituted at the request of the League of Nations, have revealed an overwhelming proportion of Christian opinion in support of the stabilization of Easter and the reform of the calendar;

Whereas the proposed fixing of Easter on April 8, as provided by The World Calendar, comes nearest the actual date of the first Easter as determined by competent scholarship;

Whereas the adoption of this reform has been favored by the representatives of practically the whole of Christendom in respect to its adherence to the time-honored division of the year into twelve months and the equalizing of the quarters of the year;

Whereas, in particular, the unity of the Christian Church directly involves a uniform calendar as desired by our brethren of the Eastern Orthodox Church, as well as by other large bodies of Christians;

Therefore, be it resolved that, with the understanding that all the great historic Christian Communions are favorable to the proposed changes, the General Convention of the Protestant Episcopal Church approves the definite stabilization of Easter on April 8 in a reformed calendar of twelve months with equal quarters;

And that copies of this resolution shall be forwarded to His Grace the Lord Arch-

bishop of Canterbury, to His Holiness the Oecumenical Patriarch of Constantinople, to His Holiness Pope Pius XI, to the President of the Universal Christian Council for Life and Work, to the Secretary of State of the United States, and to the Director-General of the League of Nations.

This resolution was brought through the Convention under the leadership of Bishop W. T. Manning of New York. In the same year action was taken by two other American Church bodies. The United Lutheran Church at its Biennial Convention held in Savannah in the same month adopted a resolution approving The World Calendar and stabilization of Easter. Similar action has been taken by the College of Bishops Methodist Episcopal Church South.

At the same time the General Council of the Presbyterian Church in the United States expressed this opinion: "There seems to be throughout the Church a high degree of unanimity of opinion with regard to the desirability of Easter stabilization and the 12-month plan of calendar reform. It is recommended that the Council express its approval of wise calendar reform, and the desirability of stabilizing Easter and other religious festivals."

Since 1934 the American section of the Universal Christian Council has been active in organizing opinion among the clergy. Cooperating with the Federal Council of Churches and with the United Press Agency it took a cross-section of clerical opinion. From 1178 replies to a questionnaire sent out to clergy representative of all denominations it was evident that general reform was favored by about 9 to 1. Easter stabilization was favored by more than 10 to 1, the 12-month revision by 7 to 1.

The Federal Council of Churches participated in the Chamby resolution. In 1936, also, the American section of the Universal Christian Council appointed a special committee which addressed to the President and the Secretary of State of the United States a letter favoring the 12-month plan, from which this is an extract: "The Universal Christian Council, as the most highly representative coordinating authority among all the non-Roman Churches, has been engaged in a formal study of calendar reform for the past four years. The undersigned (special committee) have been appointed by the American section to make this formal report to the American Government stating the favorable attitude of our churches toward the international proposals for the reform of the calendar."

CHURCH OF ENGLAND.—As far as the Church of England is concerned the position in regard to calendar reform was expressed in positive terms by the Archbishop of Canterbury (Dr. Cosmo Lang) in a speech in the House of Lords on March 4, 1936:

"Constitutionally, I have a great dislike of any proposal to change long and well-established customs unless there is a very strong reason; but I am bound to say that I have found it impossible to resist the plea for reform in this matter which comes, I think it may be said, with practical unanimity from the representatives of all the great organizations of trade, industry and commerce throughout the civilized world."

The Archbishop went on to express the view, which has been that of the Church of England since the passing of the Easter Act in 1928, that his Church could not move without the other Christian communities (i.e. in particular the Roman Curia). The Church of England was represented in the Universal Christian Council in 1936 by one of its most distinguished prelates, Dr. Bell, Bishop of Chichester.

DAYS AND DATES AND HOLIDAYS

By ERNEST F. JACOBS

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From London *Listener*, January, 1938

TO most people a calendar is a useful Christmas gift. It tells them that the meeting fixed for the 12th will be on a Wednesday, and when the week-ends fall, and so on. Often it contains edifying quotations from the great, but these, of course, have little or nothing to do with the actual function of the calendar. If such gift is really intended to mark the passage of time, then I suppose that our friends who send us calendars are tactfully implying something like what Dr. Johnson wrote to his friend Boswell in January, 1778:

"Know then, that in the first month of the present year I very highly esteem and very cordially love you, I hope to tell you this at the beginning of every year as long as we live; and why should we trouble ourselves to tell or hear it oftener?"

But stripped of its pictures and improving texts, the calendar we have received is the result of some remarkable pieces of manipulation. It looks quite a simple document, giving the division of the year into its months and days, but in its original form the calendar is the system according to which the beginning and length of successive years and the division of the year into its parts are determined for official purposes. The making of such a system involves very precise measurement of the year. The year is, of course, the time the earth takes to make a complete revolution of the sun—and so primarily it is a matter for astronomers to decide upon: but the accuracy with which they have been able to determine this period has not always been as minute as it is now.

The calendar we now use is a modification of the Roman calendar which was originally introduced by Julius Cæsar. The system of dating in that calendar is commonly termed the Old Style. According to that calendar, the ordinary year consisted of 365 days six hours; so it was decided that every fourth year should contain 366 days instead of 365, in order to find a place for the odd six hours which were owing from each of the three years before.

At first, the Romans got into difficulties over this reckoning, because they had a habit of counting both ends: they counted in the year from which calculation was made. They thought that by the "fourth" year the astronomers meant what we call the third year. So, for a little while, leap year occurred every three years! The Emperor Augustus put this right by a decree ordering 12 successive years to be leap years. The first

leap year after that was A. D. 4 of our era, and thenceforward every fourth year was a leap year.

In course of time astronomers found that they had slightly underestimated the length of the year. By the middle of the 16th century the civil year (or year by the current calendar) was 10 days behind the solar year. In 1582 Pope Gregory XIII wiped out the error by introducing the Gregorian calendar. He declared that the day after the fourth of October that year should be the 15th of October, so that 1582 had only 355 days.

At the same time he made other provisions for the more distant future. It was discovered that if a whole day was added to every fourth year, the difference between the calendar and the solar year in the course of a century amounted to nearly one day. Pope Gregory corrected this by making the last year of a century an ordinary year instead of a leap year; but this, as a matter of fact, gave a slight error the other way, amounting in 400 years to almost a day; so every 400th year was made a leap year. That, in turn, was found to be a slight over-correction, and so to make the required adjustment the years 2000, 4000, etc., are to be ordinary years.

The Catholic countries quickly adopted the Gregorian or New Style calendar; but others were slower, like Russia for instance, which did not make the change till after the Great War.

In this country we held firm to the Old Style till the middle of the 18th century and the result was that by 1700 there was a gap of 11 days between English and Continental chronology. People began to feel that this interval was intolerable, and, besides, there was another factor of difficulty: the English legal and administrative year began on the 25th of March, whereas the Continental year began on the first of January. So, at length, in 1751, an Act was passed introducing the New Style calendar into England. By this Act, the day following the 31st of December, 1751, was to be the first day in 1752, and so the beginning of the year was moved back from the 25th of March to the first of January. To bring us into line with the Continent we had to get rid of the days we had gained by sticking to the Old Style calendar, so the 11 days between the second of September and the 14th of September were taken out of 1752 altogether.

You can see how important it is for historians and people who deal with early documents to be alive to this discrepancy between English and Continental dating between 1582 and 1752. We get dates like the 10/20 of February, 1604/5: the "10" and the "1604" are the English way of stating the Continental date, which was the "20th" and "1605." So now our calendar begins the year on January 1.

But there have been all sorts of beginnings to the year: besides January the first, it has begun on the first of March, the 25th of March, Easter Sunday, the first of September, and Christmas Day. How and when these

beginnings arose was the first problem discussed by the great Benedictine scholar, Jean Mabillon, when he came to consider early methods of dating charters and documents. The most important of the earlier reckonings of the beginning of the year was one that started it with Christmas and another that started from Lady Day (the 25th of March). The reckoning from Christmas, Our Lord's Incarnation, was a common method in England before the Norman Conquest; but very soon afterward for all practical purposes it was supplanted by the 25th of March, the Feast of the Annunciation or Lady Day. From the end of the 12th century until 1752 Englishmen, officials and private individuals alike, regarded the year as beginning on Lady Day.

And now an interesting survival of the March beginning of the year: you will recollect that the Income Tax is imposed by the Annual Finance Act for a year which begins on the sixth of April and ends the following fifth of April. This is a survival of the reckoning which began the year on Lady Day—that is, the 25th of March. The lapse between Lady Day and the sixth of April represents the famous 11 days which were officially "lost" or disposed of when the calendar was reformed in 1752. But there is a practical reason for the Income Tax people sticking to this old kind of year. It is explained by the Colwyn Committee on the Income Tax which reported in 1920. They say:

"To be able to accept accounts made up to any date in the preceding year is an advantage to the Revenue Officials, because it enables them to spread the important work of examining these accounts more fully over the year than would be possible if any plan were adopted which tended to encourage taxpayers to close their accounts upon a particular date.

"It seems to us an advantage to retain an Income Tax year which begins a considerable time after the end of the calendar year, so that a large proportion of business men may have the opportunity of having their books closed and audited before the time comes for them to make their Income Tax returns." So what religion began, business retains.

So much for the calendar as a system of measuring the year. But you can get a great deal of interest, too, out of the documents that record those statistics. Some of us, who still keep the clerical minds of our ancestors, in spite of these modern and mechanical times, look forward each year to receiving the type of calendar that is called an almanac. It gives the main feasts of the Christian Church—whether they are the commemorations of saints or the movable festivals that all depend upon Easter. This is really the oldest form of calendar in the Christian West. Sometimes these calendars, the *Churchman's Almanack* for instance, give the lessons for the day in the old or in the new lectionary, and sometimes even the services peculiar to these days.

In some of the early calendars you may come across a list of the

"Egyptian," or "unlucky" days of the year. These are the days when it used to be considered unlucky to be bled; or to drink; or to eat goose; or to strike either man or beast; or to begin any work. There are generally two for every month. For December the bad ones were the seventh and the 22d. New Year's Day was one of January's two—its other was the 25th. As to why they are called Egyptian days, Durandus in the 13th Century said that the reason was either that their unlucky nature was determined by the astrologers of the Egyptians, or that they stand in some relation to the ten plagues of Egypt.

Some of these early calendars are also used for the insertions of contemporary obits, that is the notes of the death of patrons or benefactors. The famous "Obituary Calendar" of Queen's College, Oxford is a very good example of this. It is a calendar in which little notices are given (under the days of the year on which they died) of fellows who had been benefactors of the College. Early benefactors generally gave land and vestments, plate or books or money to buy rights of presentations to churches.

The entries went on being made in spite of the Reformation; in the Queen's College Calendar, for instance, they continued till the middle of the 17th Century. But by then benefactors were no longer commemorated by a session of intercession for their souls, so it was enough to have special prayers of thanksgiving (which colleges still have) asking, for example, "that the remembrance of such benefits may never slip out of our minds."

Practically all Christian calendars give Saints' Days. In the Middle Ages, of course, this was the universal method of giving a date. They might say: "Tuesday before St. Peter's Chains; Wednesday before St. Barnabas," and so on.

England has always treated the saints in its calendar as marking the seasons and periods of the year—the times of special interest to the farmer, say, the tax-gatherer and the lawyer. There is St. Swithin, for instance, on the 15th of July; St. George, who was specially honored by Henry the Fifth, and who takes us over from spring into early summer on April 23; then there are the two (can we call them) great financial saints' days, as they have come to be here, St. Michael and All Angels, that began the Exchequer and now begins the University year on the 29th of September, and the Nativity of St. John Baptist which marks the June quarter-day and midsummer. Incidentally, before 1834 the Bank of England was closed on certain saints' days and anniversaries—there were about 33 in all. In 1834 these days (which we know as "bank holidays") were reduced to four—Good Friday, May Day, All Saints (November first) and Christmas Day—and they took their present form by the Act of 1871. Of course a holiday really means a consecrated day—the day of a religious festival. Again religion has been responsible for the healthful pauses we take in our daily work.

TIME THROUGH THE AGES

By ARTHUR M. HARDING

Professor of Mathematics, University of Arkansas

This is the fifth of a series of articles on the scientific backgrounds of man's system of measuring time. The writer is a distinguished member of the American Mathematical Society, the American Astronomical Society and the American Association for the Advancement of Science. He is the author of the most popular text book on astronomy which has been published in many years.

ON NEW YEAR'S DAY, aside from making our good resolutions, we hang a new calendar on our wall and consider ourselves quite in tune with the new year. We may pause to look at the beautiful picture on the calendar, and we may even take our red pencil and ring a few important days that we wish to remember as the weeks roll by, but do we ever stop to consider how antique this calendar really is? We drive our planes 300 miles an hour, but we keep our records like the people did when Ben Hur drove his chariot. We live in an age of efficiency, but we regulate our lives by an out-of-date calendar.

The world has been rocking along for many centuries with a calendar that is far from efficient. It has been "patched up" from time to time not only to make it keep step with the seasons but also to satisfy the vanity of emperors until we now have a year that cannot be divided into halves or quarters, and months of unequal length following each other without regard to uniformity. We live and work by the week but we record time by the year and the day of the month, and these units refuse to agree.

Both Egypt and Babylon have contributed to the present calendar and here is where the difficulty lies. The Egyptians had a perpetual calendar regulated by the sun and to them the week of seven days was unknown. The Babylonian calendar was governed entirely by the moon and contained, as one of its time-units, the seven-day week. Our calendar makes use of the Egyptian year and the Egyptian month with the addition of the Babylonian week, in spite of the fact that these units—the month and the week—are what the mathematicians call incommensurable periods and do not belong in the same calendar.

If our friends advise us that we may expect them on Monday the 21st and we find that Monday is the 20th, shall we expect them on the 21st or on Monday? If my birthday falls on Sunday this year, on what day of the week will it fall in 1940? Is it any wonder that we sometimes forget to vote on Election Day, when this is not a fixed date in the calendar but "the Tuesday next after the first Monday in November"?

The problem of determining the day of the week upon which a given date will

fall several years hence presents many difficulties and can be solved only by means of some kind of a formula. A number of these formulas and so-called perpetual calendars have been proposed and can be used if we know where to find them. But why live by a calendar that requires so much mathematical calculation in order to be absolutely sure whether a certain event will occur on Monday or on Tuesday?

Suppose it is desired to find the day of the week corresponding to any given date in the Julian calendar. We may resort to any one of several formulas that have been worked out by the mathematicians. A rather simple one is the following:

$$S = Y + D + \left[\frac{Y-1}{4}\right] - 2,$$

where Y is the year number, D is the number of the day in the year, and the brackets around the fraction mean that the remainder is to be thrown away. After the value of S has been found it must be divided by 7 and the remainder will show the day of the week, the remainder 0 corresponding to Sunday, the remainder 1 corresponding to Monday, etc.

On what day of the week did Columbus discover America? Our Julian date is October 12, 1492, which was the 286th day of the year, so that Y and D represent the numbers 1492 and 286, respectively. If the number 1491 be divided by 4 the quotient is 372. Adding 1492, 286 and 372 and subtracting 2, we have 2148. When 2148 is divided by 7 the remainder is 6, which corresponds to Friday. We are now sure that America was discovered on *Friday*, October 12, 1492.

Next to Christmas, Easter is probably the most important date in the commercial world, yet it wanders through March and April with a variability of 35 days—March 22 to April 25. Many organizations begin their fiscal year on April first, so that they sometimes have two Easters in the same fiscal year and sometimes they have none. Of course we realize that nature has so arranged things that the year does not contain an exact number of days or weeks, but surely the nations of the civilized world will soon devise an efficient calendar to fit our Twentieth Century civilization. Let us review some of the recent attempts at calendar reformation.

The first attempt to reform the Gregorian calendar came in 1793 in France soon after the French Revolution in response to the demand for the elimination of everything that had been a part of the old regime. It was then proposed to adopt the old Egyptian calendar consisting of a year of 360 days with five (six in a leap year) supplementary days added at the end. Each month was to have 30 days. The seven-day week was to be entirely discarded and replaced by a week of 10 days, so that there would be exactly three weeks in every month. So much opposition to the 10-day week developed that the French Revolutionary calendar lasted only until January 1, 1806.

In 1849 a calendar of 13 months was proposed by Auguste Comte and was actually used in France for a short time. The year was divided into 13 months of 28 days each and the additional day, placed at the end of the common year, was dedicated to all good women. The extra day in leap year was consecrated to all the dead. The months in the calendar of Comte were named Moses, Homer, Aristotle, Archimedes, Caesar, Saint Paul, Charlemagne, Dante, Gutenberg, Shakespeare, Descartes, Frederick Second, and Bichat.

Although the French people less than a century ago experimented with

a perpetual calendar of 13 months of 28 days each and found it to be so unsatisfactory that they soon discarded it, the idea continued to find favor in some quarters and several times during the 19th and 20th centuries the proposal has been made to adopt a calendar of this type.

As a result of the increased interest in the adoption of a perpetual calendar, the League of Nations in 1927 considered the question of the simplification of the calendar and invited the countries of the world to present reports on calendar reform. The agitation for and against has spread throughout the civilized world and leaders of business, science, education, government and religion are now convinced that modern conditions make inevitable some reformation in our calendar.

In the United States there have been formed two different groups of calendar reformists each of which has proposed a perpetual calendar and has recently been making an active campaign for its adoption. The spirited rivalry between these two goups—the National Committee on Calendar Simplification, unofficial in character, and now inoperative, and The World Calendar Association—has kept the question of calendar revision constantly before the American people.

We have adopted the Babylonian seven-day week, and this time-unit has become a part of our existence and must be taken into consideration in any scheme of calendar reformation.

By setting aside an annual Year-End Day and a quadrennial Leap-Year Day, a calendar year of 364 days (52 weeks) can be provided which may conveniently be divided either into halves or quarters. These 364 days may obviously be broken up into 13 months of four weeks each, or they may be divided into four quarters of 13 weeks each. Which of these groupings is preferable? This question has given rise to the division of opinion between the two American groups of calendar reformists.

The National Committee on Calendar Simplification, unofficial in character, has proposed the Cotsworth calendar of 13 months of four weeks each which is identical with the French calendar of 1849 with the exception of the names of the months. The World Calendar Association advocates the adoption of The World Calendar of 12 months, with the year divided into four equal and identical quarters of 13 weeks each.

In the Cotsworth calendar each of the 13 months of the year contains exactly four weeks and every month begins on Sunday so that the first, eighth, 15th and 22d would be Sundays. All months are exactly alike and printed calendars would obviously be unnecessary. The names of our 12 months remain as they are and the new month is inserted between June and July. This new month, for which the name Sol has been proposed, would begin on what is now the 18th of June.

The proposal to adopt the Cotsworth calendar met with much opposition. In fact any 13-month calendar is sure to be unpopular for many reasons. The number 13 is not divisible by 2, 3, or 4, so that the year could not be divided into halves, thirds or quarters in such a way that they would contain a whole number of months. Many other objections might be raised, not the least of which is the fact that we are accustomed to a year of twelve months. Furthermore, we are a little superstitious about the number thirteen and many of us would prefer not to have it in the calendar.

The World Calendar Association, with the assistance of the Swiss Government, is sponsoring a calendar of 12 months which has all of the advantages and very few, if any, of the disadvantages of the 13-month calendar. The World Calendar is a perpetual one, consisting of four equal quarters of three months each. The first month in each quarter has 31 days and the others have 30 days, and each month contains the same number of working days (26). Each quarter begins on Sunday and contains exactly 13 weeks.

If we should adopt The World Calendar, January first would always come on Sunday, February would start on Wednesday and March would begin on Friday and end on Saturday. April, May and June would be exactly like January, February and March; and likewise the other two quarters, July, August, September and October, November, December. The three monthly schedules for any quarter form a perpetual calendar. After these had been memorized we would have no further use for printed calendars and millions of dollars would be saved on this item annually. Christmas would always come on Monday and Christmas Eve on Sunday, the holiday period of 48 hours being preceded by an unbroken week.

The World Calendar provides for a year of 12 months containing only 364 days. In order to take care of the 365th day it is proposed to insert an extra Saturday, called Year-End Day, between Saturday, the last day of the year, and Sunday, the first day of the new year. Year-End Day would be a holiday, and would always be a perfectly definite date, December Y or 31. Thus, if this calendar should go into effect in 1939, Year-End Day 1940 would follow Saturday, Dec. 30, 1939, and precede Sunday, Jan. 1, 1940. In a leap year another extra Saturday, called Leap-Year Day, would be inserted between Saturday, the last of June, and Sunday, the first of July.

The adoption of the 13-month calendar would make necessary the shifting of some of our fixed calendar dates by as much as a week or more. Washington's Birthday, which has already been changed from February 11 to February 22, would be moved to February 25, and on the glorious 17th of Sol we would celebrate our freedom and independence! The adoption of a 13-month year is unthinkable.

In The World Calendar the holidays would be as follows:

Year-End Day	follows December 30	Extra Saturday
New Year's Day	January 1	Sunday
Lincoln's Birthday	February 12	Sunday
Washington's Birthday	February 22	Wednesday
Easter Day	April 8	Sunday
Decoration Day	May 30	Thursday
Leap-Year Day	follows June 30	Extra Saturday
Independence Day	July 4	Wednesday
Labor Day	September 4	Monday
Columbus Day	October 12	Thursday
Election Day	November 7	Tuesday
Armistice Day	November 11	Saturday
Thanksgiving Day	November 30	Thursday
Christmas Day	December 25	Monday

The simplicity of The World Calendar is an argument in its favor, for the old calendar would glide into the new one with a minimum shifting of our present dates. Under the Gregorian calendar the dates are shifted because of the fraction of a day that is left over at the end of a year and because of the International Date-Line. For example, when the sun passes through the Vernal Equinox and announces the beginning of spring our calendars sometimes read March 21 and sometimes March 22. Again, when you sit down in your easy chair to enjoy a quiet Sunday evening at home you must realize that for most people on the earth Sunday has already passed and that it is now Monday over most of the world.

When we transfer to The World Calendar the change should be made at the beginning of a year which is not a leap year and which begins on Sunday. The year 1939 begins on Sunday and how easy it would be to adopt The World Calendar at that time! Let us hope that before the year 1939 arrives we can agree to take one day from March, May and August and give two of these days to February and one to April. How easy, if we would only do it!

Surely no one could object to considering December 31, not as a part of December, but as a balancing day between the years that makes the calendar perpetual. If we should change to The World Calendar the dates in the present calendar between February 28 and September 1 would move not more than one or two places from their present positions. Other dates would not change at all, and these readjustments are so slight that the average individual would hardly notice them. Julius Caesar might have accomplished all of this at one stroke had he only retained one of the five extra days of the Egyptian calendar for Year-End Day and distributed the other four among January, April, July and October.

How nice it would be if all of the nations of the world could only adopt this calendar and then agree on a fixed date for Easter. The question of the stabilization of Easter is a religious one and must of course be settled by the churches, but during the past few years much progress has been made along this line and we may hope for some results in the near future.

The average date of Easter during the past century has been April 8. Just think how much confusion would be saved if we could only agree that Sunday, April 8, shall always be Easter Sunday. Just think what this would mean to the church calendar with its movable festivals—Ash Wednesday, Palm Sunday, Ascension Day, Pentecost, Trinity Sunday—the dates of all of which are regulated by the date of Easter. Just think of the effect upon business interests of fixing the date of Easter, not to mention the effect upon our school calendars. For 2,000 years we have been paying tribute to Caesar. We do not like to undo anything that Caesar did, but our stubbornness is costing us millions and millions of dollars every year.

Every one who has given much thought to the question of the simplification of the calendar seems to be of the opinion that the Gregorian calendar should be modified in such a way as to better fit modern civilization. Naturally there is a difference of opinion as to what reforms should be made but, after an impartial study of the different proposals, one is forced to admit that The World Calendar has many advantages over the Gregorian calendar. The only objection worthy of consideration is that arising from the insertion of Year-End Day and Leap-Year Day in order to make the calendar perpetual. This would disturb the seven-day week in its traditional unbroken sequence.

The World Calendar is rapidly gaining in popularity but there are still

a few people who hesitate to recommend its adoption because of their desire to maintain the unbroken sequence of the seven-day week. But the seven-day week itself remains intact from Sunday through Saturday. For their benefit it may be said that the week is not a natural period of time. It is a heritage that we have received from the early astrologers, who succeeded in making people actually worship the seven so-called planets. The day and the year have been given to us by nature and man can do nothing but accept them. These are all the time-cycles we need for an efficient calendar.

After we became accustomed to The World Calendar it would probably prove very satisfactory, even though the sequence of the seven-day week which runs through history like a thread would be slightly disturbed. Those who are inclined to stress the importance of preserving the mystic number seven because of the many superstitions associated with it, might also object to having Friday the 13th occur four times every year—in January, April, July and October—as it would in The World Calendar.

It is said that the early Hebrews sometimes had Sabbaths 48 hours long in order to adjust their religious year to the astronomical year. Those who now object to The World Calendar because of the proposed disturbance of the sequence of the seven-day week may perhaps be willing to consider December 30 as a Saturday (Sabbath) of 48 hours. The last Saturday in the first half of the year (June 30) would contain only 24 hours in ordinary years but in a leap year this particular Saturday would contain 48 hours. Thus there would be a double Saturday at the end of each half of a leap year.

In the December, 1937, issue of the JOURNAL OF CALENDAR REFORM, Rabbi Martin M. Weitz calls attention to the ancient Jewish practice of lengthening the major rest days and festivals. He goes on to say that "Orthodox Jewry celebrates eight and not seven days for Tabernacles and Passover, and two, not one, for New Year and Pentecost, in order that Jewry all over the world shall be able to celebrate these festivals simultaneously." The World Calendar with its Year-End Day and Leap-Year Day, would provide two days of leisure that could be celebrated simultaneously by people in all parts of the world.

Less than 60 years ago the United States took the initiative and secured the world-wide adoption of STANDARD TIME. Let us hope that today the American Government will bring The WORLD CALENDAR to the attention of other countries in such a way as to insure its careful study and final adoption.

RECENT CALENDAR RESEARCH

Japanese Proposals

By ROKURO TOKUDA

In Tokyo *Nichi Nichi Shimbun*

JAPAN feels that revision of the Gregorian calendar would certainly be of great benefit to international trade and economic life. We are glad that the League of Nations has been giving this matter its consideration. Many and various proposals for such a revision have been presented, including the 13-month plan, which was advocated in Japan by Mr. Cotsworth when he visited our country some years ago. His plan, however, has never been taken seriously by the League of Nations, in view of its probable effect on traditional trade relations and on social and religious viewpoints.

一　月							二　月							三　月						
日	月	火	水	木	金	土	日	月	火	水	木	金	土	日	月	火	水	木	金	土
1	2	3	4	5	6	7					1	2	3	4					1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30

第一四半期

四　月							五　月							六　月						
日	月	火	水	木	金	土	日	月	火	水	木	金	土	日	月	火	水	木	金	土
1	2	3	4	5	6	7					1	2	3	4					1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30

第二四半期

（閏年には六月卅日の次に「閏日」が入る）

七　月							八　月							九　月						
日	月	火	水	木	金	土	日	月	火	水	木	金	土	日	月	火	水	木	金	土
1	2	3	4	5	6	7					1	2	3	4					1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30

第三四半期

十　月							十一月							十二月						
日	月	火	水	木	金	土	日	月	火	水	木	金	土	日	月	火	水	木	金	土
1	2	3	4	5	6	7					1	2	3	4					1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30

第四四半期

（毎年十二月卅日の次に「年末日」が入る）

Discussion of this matter in the League of Nations has naturally been prolonged. But it eventually arrived at a point where the Chilean Government requested the League to circulate an international treaty for the enactment of the plan known as The World Calendar. This proposal retains the 12-month system, but rearranges the length of months so that all quarters are equal and identical. Also, the calendar is made perpetual and permanent by the use of an intercalated or inserted day at certain intervals.

Application of the new system has the merits of efficiency and economy, and it will make the comparison of statistics much simpler. It makes the calendar conform better to the seasons, and enables feast days and holidays to come at fixed dates. The transition period has been arranged in such a way that the change from old to new calendars will take place with no inconveniences.

Vagaries Cause Trouble

By ARTHUR WILLIAMS

Export Manager, Woodstock Typewriter Co., in Chicago *Credit News*

LOOK at some of the defects of the present calendar. There is the constant but quite irregular wandering of the day of the month through the days of the week, making it practically impossible to determine quickly, without the aid of printed tables, the day of the week for a given date, either past or future. The months have varying lengths without rhyme or reason. The number of weekdays in a month may be 24, 25, 26 or 27. Comparisons in business of one month with another, even with a month in another year, are never fair nor correct unless complicated adjustments are made. In many lines of business, five Saturdays in a calendar month is a misfortune, especially if weekly paydays come on that day.

The vagaries of our calendar are a constant source of annoyance to periodical publishers, because of the constantly changing monthly dates and days of the week. With weeklies published on a certain weekday, the dates of the month

change every month. And a weekly may have 52 or 53 publication days in a year.

Trying to make up a school calendar is a nightmare which recurs annually. And this is just a sample of difficulties which will be done away with upon adoption of The World Calendar.

Nautical Almanac Changes

By Prof. W. J. Luyten

In *Amsterdam Telegraaf*

CRITICISM of the proposals for calendar revision has come recently from Mr. A. Asscher, on the ground that the transition into a new calendar will cause confusion in the nautical tabulations on which all world navigation depends.

All these nautical tabulations, showing the positions of sun, moon and stars on every day of the year, are published annually through the cooperation of various nautical observatories. The only change needed in these annual compilations is a change in the "name" of days. For example, Dec. 31 would be listed by its new name or initials. This is simplicity itself, and can hardly justify the use of the word "drastic" in Mr. Asscher's article.

A really "drastic" change took place in all nautical almanacs in 1925, when the commencement of the astronomical or nautical day was put back from 12 noon to 12 midnight, making a change of half a day in all data. This drastic change never resulted in any disasters at sea.

Mr. Asscher suggests that for some reason the new calendar would interfere with the "accurate tidal charts on which depend the safety of thousands at sea." I see no basis for this charge. The tides are governed principally by the course of the moon. Reliability of tidal forecasts does not gain or lose through adoption of a more accurate calendar.

The final objection of Mr. Asscher, based on "interference with statistical comparisons," is one on which he would better keep silent. Under the present calendar, statistical comparisons are complicated by unequal quarters and wandering arrangements of weekdays. Moreover, if one attaches importance to expert opinion on this subject, it is only necessary to consult the verdict of the Royal Statistical Society of England and that of the American Statistical Association, both of which favor adoption of The World Calendar for the express reason that it will simplify statistical comparison.

Of course, as with all beneficent changes, a few minor difficulties are to be expected during the short transition period while the new calendar is being adopted. It is clear, however, that all necessary adjustments can be made simply. Arguments based on difficulties in transition are essentially merely an understandable "fear of the New." Most opponents of reform, who are such merely from conservatism and reluctance to change anything, quickly accept the new thing when put in force.

As to the religious objections which Mr. Asscher mentions, I can only submit that there is an impressive body of religious opinion for the new calendar, including leaders of the Roman, Orthodox, Protestant and even Jewish faiths.

Julian Calendar

By E. James Glostman

Scarborough (England) *News*

WITH a sturdy independence which has lasted nearly two centuries, the hardy inhabitants of the Shetland Islands traditionally keep Christmas on January 5 and New Year's Day on January 12. The rest of Britain fell reluctantly into line with the rest of Europe by changing the calendar in 1752. When Pope Gregory amended the old Julian calendar at the end of the 16th century, anti-papal feeling in Britain opposed the change and it was not until 1751 that Parliament decided to adopt the Gregorian reckoning by "jumping" 11 days in the succeeding September. Intense indignation was expressed by partisans who felt that they were being robbed of time, and the popular cry was "Give us back our 11 days."

The only people who eventually refused to sacrifice the days were the "Viking" descendants inhabiting the Shetlands—and though in recent years the modern reckoning has been gradually adopted, the old style still persists in the outlying islands of the 24 inhabited isles which constitute the group. So they begin to organize Christmas festivities when the rest of Britain is recovering from them.

CURRENT PRESS COMMENT

Church Attitude

Wilmington Star

Recent religious preference in calendar reform has been for The World Calendar, the churches of the Christian world being opposed to the 13-month year because of the radical changes it would make in feast days. In 1934 agreement was reached by the Protestant and the Greek Orthodox churches to set Easter on April 8. Inasmuch as Easter fixes dates for all other feasts and fasts except Christmas and Epiphany, the entire ecclesiastical year thus would be immovable. The only change to be made with Christmas and Epiphany in the proposal would be to fix them to certain weekdays, Christmas on Monday and Epiphany on Friday.

Practical Arguments

Rome (Italy) Sapere

Irregularities of the present calendar cause confusion and uncertainty in economic relations. Many statistical problems are made very intricate, especially those referring to commercial and industrial affairs. The proposals for adoption of The World Calendar are inspired and actuated above all by practical arguments.

Under this new calendar, it is interesting to note that almost all of Italy's civil holidays will fall on Saturday—February 11 (Conciliation Day); March 23 (Fascist Day); April 21 (Anniversary of Rome); November 11 (Emperor's Birthday).

International Activity

Amsterdam (Holland) Residentie Bode

Professor Obbink in the *Algemeen Weekblad* calls attention to the calendar reform activities of the National Education Association of the United States, which has endorsed the equal-quarter plan for revision of the Gregorian calendar.

Interest in this plan has existed for 12 years or more in Holland. It was 12 years ago that Prof. van Eysinga was appointed by the League of Nations to head their first studies of the subject.

Vatican Views

Dublin (Ireland) Irish Times

There has been more real interest in the subject of calendar reform by the leaders of the Catholic Church than by any other group. It is interesting to note what the Vatican has stated and communicated to many Governments. The League of Nations Society of Ireland, at its monthly session here, heard an important discussion of the subject from E. K. Eason, who explained that as far as the general plan of calendar reform is concerned, there is only one proposal which is now taken seriously in official circles—the 12-month equal-quarter plan. Other plans are of historical interest but of no importance.

Contribution to Society

Reformed Church Bulletin

Adoption of daylight saving time emphasizes the confusion one encounters when looking at the clocks of the world with the various times which they display. However, the confusion is increased when one looks at the calendars in use throughout the world. Something has been done from time to time with reference to the computation of time. Calendar reform has moved slowly but a definite progress is noted in the efforts of The World Calendar Association. As great as its contribution to the church and religious bodies of the world would be, even greater would be its benefits to business and social interests.

Stabilize the Holidays

Grand Rapids Press

The inconvenience of a midweek holiday is a reminder that these roving holidays of ours need not be tolerated. And the date may not be far distant when they will not be, for the movement toward calendar reform is rapidly spreading. Not only has a League of Nations commission given official attention to the matter, but now our own General Federation of Women's Clubs proposes to give the subject a thorough investigation.

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EDITORS

CHARLES D. MORRIS CHARLES C. SUTTER

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A BILL providing for Monday holidays was recently introduced (June, 1937) in the United States Senate by Senator Johnson of Colorado, and referred to the Committee on Education and Labor. It provides "for observing on Monday certain legal public holidays." The text suggests: "that from the date of enactment of this act, whenever the 1st day of January, the 22nd day of February, the 30th day of May, the 4th of July, or Thanksgiving Day occurs on any day other than Monday, such day shall not be observed on the day on which it actually occurs, but shall instead be observed on the Monday nearest to the day on which it actually occurs, in the same manner and to the same extent as though such day actually occurred on Monday."

Similar bills have been introduced in the state legislatures of New York and New Jersey. The New Jersey bill, "An Act to provide for observing on Monday certain legal holidays," provides: "that from the date of enactment of this act, whenever the 12th of February, the 22nd of February, the 30th of May, the 4th day of July, the 12th day of October, or the 11th day of November occurs on any day other than Monday, such day shall not be observed on the day on which it actually occurs but shall, instead, be observed on the Monday nearest to the day on which it actually occurs, in the same manner and to the same extent as though such day actually occurred on Monday; that the Governor shall, before the first day of January of each year hereafter, determine the exact Monday on which the aforesaid described dates shall actually be celebrated."

The fact that the New Jersey Governor must every year determine upon the exact Monday on which holidays are to be placed clearly indicates the still wandering character of such holidays, and the difficulty to be encountered whether the Monday before or after the event should be chosen.

The World Calendar, which calls for a stabilized and ordered calendar, would make all such uncertainty and vagueness unnecessary. A few of the Monday holidays as they would appear in The World Calendar, so as to permanently give long week-ends, are discussed on pages 8 and 9 of this issue.

EXCERPTS AND REVIEWS

Conflicting Calendars

By H. E. COUGHLIN

London Weekly Telegraph

WHEN you receive a new calendar, at the beginning of a new year, you probably notice how the calendar varies from year to year, and you wonder why. You would have wondered still more had you lived in 1462 of the Egyptian Era. For it was an Egyptian astronomer who discovered that a year is more than 365 days by a few hours, calculating that this meant a loss of a day every 1,460 years. So the Egyptians made a cycle of 1,460 years in their calendar, and instead of calling the first year after the cycle 1461, called it 1462, leaving out one year in every cycle!

Not that Egypt only knew of the calendar. The Chaldeans and Red Indians had a calendar of a sort long, long ago.

The peoples of the East had their calendars, though different from ours. The Chinese date their years now from the foundation of their Republic under Sun Yat Sen. The Japanese dated theirs from the legendary beginnings of their Empire. This Empire started, they say, when a tyrannical ruler of China dispatched an expedition to their islands. The Mohammedan Era began from the year A.D. 622, when Mohammed fled from Mecca.

In Europe, among the Greeks and Romans, calendars were known at an early date. The Greeks reckoned their dates from the last Olympic Games held every four years. But Roman documents used to be dated from the legendary founding of Rome by Romulus in 733 B.C. In 45 B.C., however, Julius Cæsar reformed the entire calendar.

Our present calendar is based on this so-called Julian calendar. He reckoned that the year consists of 365 days 6 hours, and out of the six hours he made an extra day every four years. This is the Leap Year of blessed memory, though few remember that to Cæsar be the thanks for it.

It was discovered in 1582 by Pope Gregory XIII, that the year is actually less than 365 days 6 hours, and that therefore we had gained 10 days. So in that year he cut 10 days out of October, October 5 becoming October 15. To make sure that it wouldn't occur again the Gregorian Calendar lays it down that February 29 shall be dropped from Leap Year three times in every 400 years. The year 1900 was not Leap Year. Neither was 1800, nor 1700.

Triumph of Wisdom

By P. W. WILSON

The Churchman, New York

IN WRITING my book, The Romance of the Calendar, I examined every significant method of measuring time devised by man since the dawn of history. Experience and experiment covering thousands of years lead to one inescapable conclusion. The solar year of 365¼ days is, as it stands, calendrically impossible.

Egyptians segregated 5 epagomenal or outside-monthly days, so arriving at a year of 360 days or 12 months of 30 days. With such a year and such months, the 7-day week does not synchronize. No such year of such months is proposed by advocates of The World Calendar.

The World Calendar segregates one day a year and a second day in leap year. Intercalation is thus reduced to a minimum and the resultant year of 364 days contains exactly 52 weeks of 7 days and 4 equal quarters of 91 days or 13 weeks.

It is possible to adopt a period of 364 days as a standard for year, month and week without intercalating the days above mentioned. The alternative proposal, namely, allowing the odd day or days to pile up into complete weeks or months which would then be cancelled, means that years would vary in length, and this proposal, therefore, is not seriously discussed by statesmen. A calendar, so "reformed," would be much less convenient than the Gregorian Calendar that we are using.

The World Calendar is thus the only improved calendar that is to be regarded as practical politics. Does it or does it not sacrifice the 7-day week?

The week of 7 days was not in the original Julian Calendar. It was authorized by Constantine during the Council of Nicaea

in A.D. 325. In some quarters, there may be, therefore, a tendency to regard the week as a unit of time-calculation.

Speaking for myself, I would not support any reform of the calendar that sacrificed the 7-day week in any particular. This week was inherited by the Christian church, by Islam and by secular society from Judaism. In many differing communions of faith, it furnishes the day for general public worship. It is also of supreme value as the accepted time-period for wages, rents, instalments and other payments. Most important the week provides for regular rest-days. Attempts to lengthen, shorten or abolish the week—for instance, in revolutionary France and Russia—were not a success.

I cannot agree that The World Calendar does sacrifice the week. On the contrary, it entrenches the week for the first time within the year and the quarter. The seventh day of the week or Jewish Sabbath is the seventh day of every year and every quarter of the year. The first day of the week or Christian Sunday is the first day of the year and of the quarters. For these reasons, the Christian churches as a whole and many Jewish leaders regard The World Calendar not only without alarm, but as a safeguard for the week.

It is true that Year-End Day and Leap-Year Day fall between weeks—that certain successive weeks are separated by one such day. But this does not destroy any Sabbath, whether Jewish, Christian, or Islam. On the contrary, it doubles the rest-day, and so adds a Sabbath to the Sabbath. One reads the Mosaic literature and is impressed by the splendid insistence therein on man's freedom to enjoy holidays. Of that freedom The World Calendar is a Magna Carta. It extends the Jewish week throughout the worlds of India, China and the East as a whole where previously it was little known.

Seventh Day Adventists and the Jewish communities that agree with them on the point at issue, are concerned because the sequence of the 7-day week is, as they think, interrupted. In China a sequence of 28-day or quadruple weeks has been maintained for thousands of years.

If then a minority of Jews and Christians consider that, to them, the 7-day sequence is all-important, so be it. I was brought up in a small religious community, Plymouth Brethren. I appreciate susceptibilities sincerely cherished.

But the Plymouth Brethren, as I remember them, did not force their susceptibilities on the world as a whole. They accepted their position as "a peculiar (or separate) people" (*Titus* II.14) and regarded any disabilities attaching thereto as a spiritual privilege. Despite their convictions they were thus held in high respect by their neighbors.

We are living in disturbed times. A duty is thus laid upon all people of goodwill. That duty is, surely, to reduce points of difference to a minimum and to emphasize points of agreement. The safety of lives and homes, especially among minorities, is dependent on the fulfilment of this duty in all the arenas of human activity.

It would be a triumph of commonsense within the commonwealth if a civilization that includes many races, faiths and nations were to agree at least on the simplest and most logical method of measuring time. There is opportunity for wisdom that transcends argument and contention.

As a Lawyer Sees It

By George Gordon Battle

New York Law Journal

PROPOSALS to reform the present calendar must necessarily attract the attention of the lawyer in active practice, for there is perhaps no one to whom the calendar is more important. It has been suggested that the lawyer's diary is as indispensable to him as a schedule and a watch are to the locomotive engineer. The comparison errs on the side of understatement, for the diary of the active lawyer varies so greatly from day to day and touches on so many different aspects of so many different matters that it would be more nearly comparable to a railroad schedule which changed completely every day, if not indeed more often.

I believe most lawyers will favor The World Calendar. This plan appears to have all of the advantages for which reform is sought, and has no apparent disadvantages.

I think our profession is particularly interested in the work of The World Calendar Association.

FROM THE MAIL BAG

I am interested in this, as in all other projects, that strive to reduce the complex to the simple, the intangible to the knowable. Many thanks!—Rabbi Herman Pollack, Temple Israel, Blytheville, Arkansas.

I am in favor of the suggested change in the calendar by the League of Nations, provided that it was adopted by most of the leading nations, so as not to create confusion. I am thinking of the matter partly from the standpoint of a historian, although I have also been a business man and many other things. It would, of course, be unwise to have different calendars used in different countries, but on the whole, the plan, provided that it was sufficiently widely accepted, seems to me sound.—James Truslow Adams, Historian, Southport, Conn.

Have been greatly interested in this Calendar Reform work and I have followed the progress through your valuable journal from month to month.—C. B. Sethna, New Marine Lines, Bombay.

The Journal of Calendar Reform constitutes a veritable encyclopedia on the subject, and is a valuable contribution to our library.—Rev. Sylvester Brielmaier, St. Anthony's Monastery, Marathon, Wis.

I believe the question of calendar reform should be made a matter of education, particularly in the secondary schools and colleges and that we should endeavor to raise up a generation which would see the need for this change and be willing to break the traditions which are necessary in order to secure a better calendar arrangement.—A. Z. Mann, Acting Pres., Int. Y. M. C. A. College, Springfield.

Very much in sympathy with the movement.—Clyde R. H. Taylor, Alexander Turnbull Library, Wellington, N. Z.

During a long ministry in England and the U. S. A. I have felt the inconvenience of our present calendar and have desired its reformation.—Very Rev. Marmaduke Hare, Dean, Trinity Cathedral, Iowa.

I find myself in sympathy with your aims.—W. N. Polakov, Sherman, Conn.

The proposal is very interesting.—H. N. MacCracken, Pres., Vassar College.

I believe your proposals are on the right lines and should be adopted. They would be an all-around benefit and certainly engineers will be sympathetic.—G. W. Hayler, Engineer, San Francisco.

Your Journal stands in a class by itself on this particular subject of Calendar Reform. It makes a strong appeal to those who appreciate high scholarship, factual accuracy, and scientific information. After having read the latest number, I felt it should have a place in the classroom of every American High School.—A. W. Skardon, Walterboro, S. C.

Heartily in favor of the new 12 month calendar. Keep up the education and let's get it in force by 1939.—H. B. Boyd, D.D., Philadelphia.

I was born on Easter Sunday, April 2, 1899, and, owing to the method of fixing Easter, although I had Good Friday birthdays in 1915, 1920 and 1926, I have never had an Easter Sunday birthday anniversary.—M. Smythe, Birmingham, England.

There is no reason why this very sensible change should not take place.—C. J. Smith, Pres., Roanoke College, Salem, Va.

I have been interested in reading from time to time the publicity on calendar reform that comes to me in occasional letters and also through the newspapers.—Caroline O'Day, U. S. Congresswoman from New York.

Some kind of reform is inevitable, and college students should know what the problem is and the proposals for change.—I. J. Good, Pres., Indiana Central College, Indianapolis.

We have examined your proposition thoroughly and shall compare notes with the Swiss authorities.—Dr. Joseph Hoop, Administrator of the Principality of Liechtenstein.

As a schoolman I am very much in favor of any calendar change that will make it possible for us to eliminate the eternal problem of establishing the calendar for the school year.—L. W. Boe, Pres., St. Olaf College, Northfield, Minn.

MEMBERS OF THE WORLD CALENDAR ASSOCIATION

International Building, 630 Fifth Ave., New York City

Membership is based on active interest in the study of adequate and effective improvement of the calendar. Owing to lack of space, a large number of names have been omitted. They will be printed in future issues.

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BELGIUM: Belgian National Committee on Calendar Reform, Professor M. Dehalu, President, l'Université de Liége, Liége, Belgium.

BOLIVIA: Comite Boliviano del Calendario Mundial, Don Moises Santivanez, Chairman, Biblioteca Nacional, Sucre.

BRAZIL: Comite Brasilero del Calendario Mundial, Captain Radler de Aquino, Chairman, Rua Raul Pompeia No. 133, Rio de Janeiro.

CANADA: Rational Calendar Association, Lt. Col. J. Murray Muir, Secy., Room 218, 2 College St., Toronto 5.

CHILE: Comite Chileno del Calendario Mundial, Padre Valentin Panzarasa, Chairman, Rector del Colegio Patrocinio de San Jose, Bellavista 0550, Santiago.

CHINA: Chinese Association for the Study of Calendar Reform, Ch'ing-Sung Yü, Director, National Research Institute of Astronomy, Nanking.

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PERU: Comite Peruano del Calendario Mundial, Don Luis Montero y Tirado, Chairman, Casilla 220, Lima.

SOUTH AMERICA: Comite Latino-Americano del Calendario Mundial, Dr. I. Gajardo Reyes, President, Santiago, Chile. This commitee directs the activities of national organizations in Argentina, Brazil, Costa Rica, Mexico, Uruguay, Chile, Peru, Bolivia, Colombia and Panama. The honorary presidents of the committee are Dr. L. S. Rowe, Director-General of the Pan American Union and Dr. Alfredo de Castro.

SPAIN: Spanish Calendar Reform Committee, Father Luis Rodes, S. J., Chairman, Ebro Observatorio, Tortosa.

SWITZERLAND: Swiss National Committee on Calendar Reform, Prof. Emile Marchand, Secy., Mythenstrasse 2, Zurich 2. —Comité International de Coopération de l'Association Universelle du Calendrier, M. Raymond Mage, Secrétaire Général, Palais Wilson, Geneva.

TURKEY: Committee on Calendar Reform, Prof. Ihsan Ali, Secy., Ayas Pasa Nimet Apt. 3, Istanbul.

URUGUAY: Comite Uruguayo del Calendario Mundial (Igualmente del Paraguay), Prof. Alberto Reyes Thevenet, Chairman, Liceo de Ensenanza Secundaria Hector Miranda, Calle Sierra 2268, Montevideo.

VENEZUELA: Comite Venezolano del Calendario Mundial, Senora Maria Luisa de Escobar, Chairman, Sur 1, 128, Caracas.

EDITORIAL PARAGRAPHS

So unreliable are statistical comparisons under our unbalanced Gregorian calendar that today there is a world-wide movement, sponsored by powerful industrial and commercial interests, eminent scientists, astronomers and statisticians, to escape from its muddlesome toils.—Leicester (England) *Mercury.*

The Trade Association believes that taking everything into account, the future interests of Austrian business makes the reform of the calendar a worthwhile proposal.—*Korneuburger Bezirksbote* (Austria.)

It seems rather strange that the controversy of something like a decade ago over the 13 months' calendar is not being repeated, there was much discussion of it and much opposition. This paper objected to it at every opportunity. But the proposed World Calendar seems so sensible, and so likely to endure that there is no reason to oppose its adoption.—Lansing (Mich.) *State Journal.*

We wish to go on record casting our vote for The World Calendar as proposed to take the place of the Gregorian calendar. Man has inherited an unhappy family of time because of the 365-day year.—St. Joseph (Mo.) *News-Press.*

It is business people who are most strongly urging the reform because it would simplify not only their bookkeeping and accounts, but also their estimating and costing, for the reason that the new system would provide consistent numbers of working days in each week and month.—Notts (England) *Post.*

Once in use, the value of this calendar to the business, the professional, the scientific and the religious world will be incalculable.—Ironwood (Mich.) *Globe.*

The proposed calendar would have the merit of having the same number of secular days in each month. The month with five Sundays would have the extra day, making 26 days in each month for business, holidays, etc. This would make comparisons easy. The plan has much to commend it.—Centerville (Iowa) *Citizen.*

In this country we seem to have changed from a March to a January date for our presidential inauguration without any disturbance of business and without distress to anyone save the weatherman. Perhaps we may be fortunate enough to have the new calendar adopted and thus avoid having a mid-winter temperature Easter thrust upon us.—Jersey City *Journal.*

The reformed 12-month calendar is very suitable for statistical purposes, making the 13-month calendar superfluous; and it is obvious how advantageous it would be if the present double efforts could be avoided. It is to be hoped that the necessary steps will be taken in Geneva for its realization without delay.—Zurich (Switzerland) *Neue Zuercher Zeitung.*

While the subject has not been generally exploited a large number of national governments and labor organizations have given tentative approval toward the new plan and before long we may suddenly realize that an effort has been started in earnest to cure what Shakespeare complained of—time being out of joint—Danville (Va.) *Bee.*

It is well known that the present calendar is not very satisfactory in its application to economic, social and religious fields. Extended studies have revealed a desire to bring about revision. Calendar reform is a job for experts, and the experts have spoken.—Dayton (Ohio) *Herald.*

Almost everyone recognizes the shortcomings and inconveniences of the present calendar, and favors change. In recent years sentiment has tended to crystallize about the so-called World Calendar.—Cincinnati *Enquirer.*

Now, however, a moderate calendar reform is proposed and practically everyone who cares to have a say in the matter appears to be satisfied. Even the churches have gotten together.—Lansing (Mich.) *State Journal.*

It is not to be ignored that the present system of dividing time presents certain inconveniences.—Santiago (Chile) *El Mercurio.*

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JOURNAL OF CALENDAR REFORM

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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter							Second Quarter							Third Quarter							Fourth Quarter						
JANUARY							APRIL							JULY							OCTOBER						
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* YEAR-END DAY, December Y or 31, an extra Saturday, follows December 30th every year.
** LEAP-YEAR DAY, June L or 31, another extra Saturday, follows June 30th in leap years.

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a *"perpetual"* calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Each month has 26 weekdays.

In order to make the calendar perpetual, at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap year, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y or 31 and June L or 31, and would probably be observed as international holidays, January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays when approved by their respective authorities. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made with a minimum of disturbance.

"Our stability is but balance."—Robert Bridges.

ASTRONOMICAL OPINIONS ON CALENDAR REFORM

I am in favor of revision and a fixed Easter.—Sir James H. Jeans, Dorking, England.

To me, it seems a sort of duty upon the race to remove the deteriorations of the Julian calendar.—Svante Arrhenius, Lund, Sweden.

I would be inclined to support a movement for a calendar reform resolution in the National Academy of Sciences.—Prof. Harlow Shapley, Harvard University, Massachusetts.

The World Calendar when adopted will be one of the greatest gifts to humanity.—C. S. Yu, Nanking, China.

I approve entirely of The World Calendar.—A. Cotton, Sorbonne, Paris, France.

The change in reckoning will be so slight when it takes place that you will hardly know the difference.—Prof. Harlan T. Stetson, Harvard University, Massachusetts.

This World Calendar is an enormous improvement.—M. Minnaert, Utrecht, Holland.

Have long been a supporter of calendar reform.—L. Driencourt, Noyon, France.

The present calendar has defects which everyone recognizes.—C. D. Perrine, Cordoba, Argentina.

Change of calendar would be important to science as well as business.—Otto Struve, Yerkes Observatory, Green Bay, Wisconsin.

This reform of the calendar would be very useful.—J. Gadomski, Warsaw, Poland.

Revision of our calendar in the near future is inevitable.—N. B. Masek, Prague, Czechoslovakia.

Scientific circles should heartily approve The World Calendar.—R. A. Rossiter, Bloemfontein, South Africa.

The question is not whether we shall have reform, but how soon shall we get it.—W. H. Pickering, Jamaica.

Revision of the calendar is desirable.—Svein Rosseland, Oslo, Norway.

I hold that revision is urgently necessary.—Prof. Kohlschutter, Potsdam, Germany.

For practical civil life it is very valuable and desirable.—Luigi Carnera, Naples, Italy.

The present calendar should be revised.—Issei Yamamoto, Kyoto, Japan.

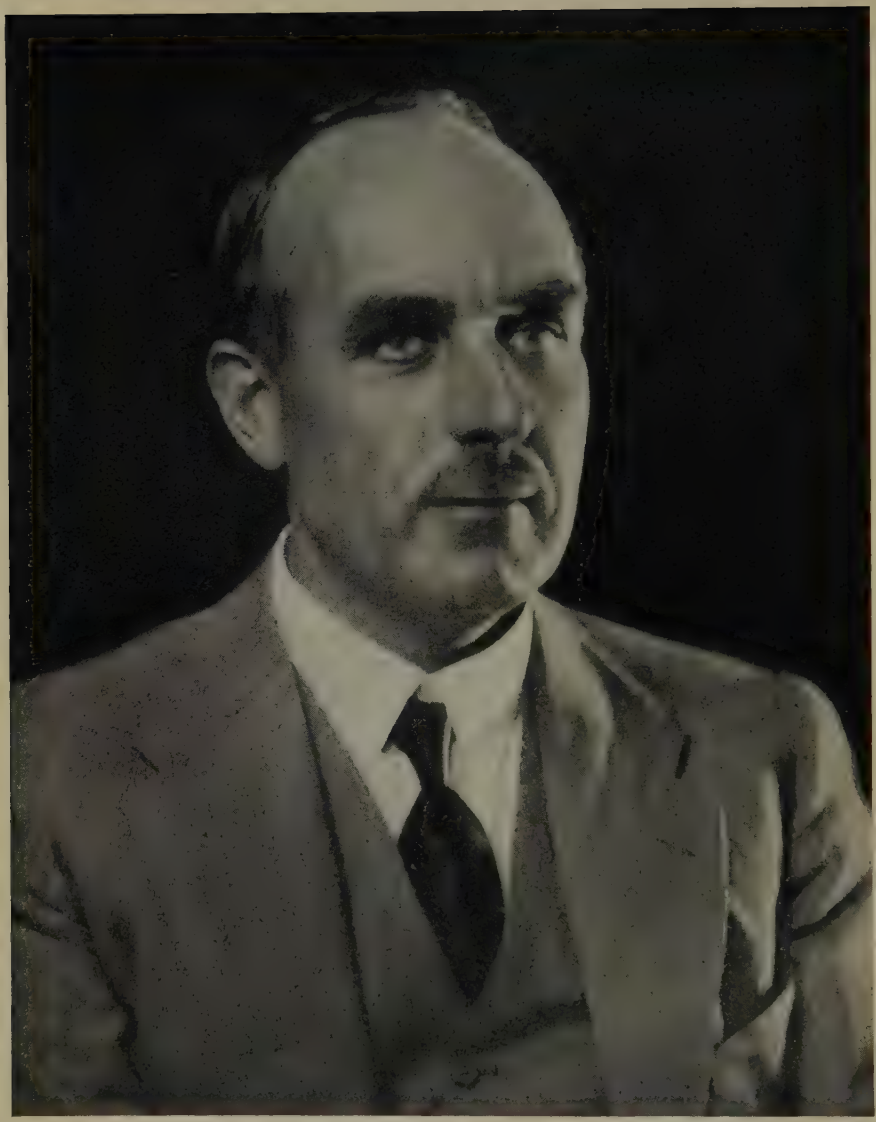
I approve The World Calendar.—H. L. Vanderlinden, Ghent, Belgium.

Reform is desirable.—Prof. Gallissot, Lille, France.

Heartily in favor of The World Calendar.—S. L. Boothroyd, Cornell University, New York.

The sooner the plan is put into action, the better.—W. J. Luyten, Minneapolis, Minnesota.

I favor revision.—C. A. Chant, Toronto, Canada.



DR. H. SPENCER-JONES, F.R.S.

Astronomer Royal

"Many of the foremost astronomers in all countries have expressed themselves in favor of The World Calendar. I am personally in favor of this plan."

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ASTRONOMY'S VESTED INTEREST

By DR. H. SPENCER-JONES, F.R.S.

Astronomer Royal, London.

ASTRONOMERS are regarded as having a special responsibility for the calendar and for this reason, perhaps, special attention is given to the opinions of astronomers on all matters that affect the calendar. The measurement of time is, of course, a fundamental concern of the astronomer.

It is not generally realized, perhaps, that this is not the simple matter that it may appear to be at first sight. The Earth provides our standard clock and we may define a day as the interval required for the Earth to make one complete rotation on its axis. But we must fix the rotation with reference to one of the heavenly bodies. Suppose we choose the Sun, which regulates the period of day and night and which therefore ultimately controls our daily life. We should then find that the days would not be of equal length throughout the year and serious inconvenience would result. Instead of the Sun we could choose the stars. The days would then be of equal length but the day would have no relation to the Sun; for half the year midday would occur during the period of darkness, when the Sun is below the horizon. Our daily activities would begin and end at different times each day.

The civil day is therefore determined by the rotation of the Earth with reference to an *imaginary* mean Sun, defined in such a way that all days are of equal length and such that this length is equal to the *average*

length of the days, when we use the true Sun as the reference body. Mean noon, i.e., 12 o'clock, is then never more than about 16½ minutes different from true noon, the instant when the Sun is at its highest in the sky.

There are two other important intervals of time with which human life is closely concerned. One is the tropical year, which determines the return of the seasons; its length is 365.24219 days. The other is the synodic month, which determines the phases of the moon and is of importance in tidal phenomena; its length is 29.5305879 days. The number of synodic months, or lunations, in a tropical year is 12.3682668.

Thus the day, the month and the year are fundamentally based on the Earth, the Moon and the Sun. A calendar is a means of combining these various periods for the purposes of civil and religious life. The difficulties are introduced by the incommensurability of the three fundamental periods. In some of the old calendars, the synodic month was regarded as the most important of these three periods and everything was based on it. The number of days in the month was either 29 or 30, some rules being necessary to keep the average length of the month approximately correct. The number of months in the year was sometimes 12, sometimes 13. In China a special tribunal fixed the calendar and decided whether in any one year there should be 12 or 13 months, the length of the year being adjusted in this way to prevent the seasons drifting through the year.

The calendar now used by the greater part of the world is the Gregorian calendar, instituted in 1582 by Pope Gregory XIII, but not adopted in England until 1752. This calendar was a modification of the Julian calendar, introduced by Julius Caesar, in framing which he had the assistance of the Astronomer Sosigenes of Alexandria; some minor alterations were introduced by Augustus Caesar.

In the Julian calendar, the average length of the year was 365.25 days, one year in four being a leap year with 366 days. In order to have 12 months in a year, the months were given the number of days that they have at present, and therefore ceased to have any relation to the Moon. The month became a purely artificial period, as the week had always been. In the Gregorian calendar, certain leap years were omitted, to reduce the average length of the year, which became 365.2425 days. This is still slightly too long. The dates of the Easter full moons are determined on this calendar by fairly simple rules and with considerable accuracy, though it may be noted that the ecclesiastical full moon is not identical with the astronomical full moon; the former, which is used for fixing Easter and other religious festivals, is essentially based on a fictitious moon.

Proposals for the reform of the calendar do not affect the year, as determined by the Gregorian calendar. They are designed to remedy some of the inconveniences of the present division of the year into months and weeks. Most people can only remember whether any given month has

30 or 31 days by repeating the mnemonic "thirty days hath September, etc." The quarters are unequal and the first half of the year has only 181 days (182 in leap years) as compared with 184 days in the second half. A complete year contains 52 weeks plus one or two days, so that the day of the week on which any particular date falls changes from year to year. To find the day of the week on which any particular date falls in any given year we must refer to a calendar.

Though various schemes of calendar reform have been proposed, the only feasible scheme in my opinion is the one advocated by The World Calendar Association of America and by the Rational Calendar Association of Great Britain, embodying equalized quarters with intercalated days. Each quarter contains 91 days or 13 weeks, beginning with Sunday and ending with Saturday; the months have respectively 31, 30, 30 days. There is an intercalary day at the end of the year and in leap years an additional intercalary day between the first and second halves of the year. These days break the continuity of the week and objection has been taken to this in some quarters. To me the objections do not appear very strong. The advantages of this reformed calendar, combined with a fixed Easter, would undoubtedly be considerable, in business and to the community at large. The day of the week corresponding to any date in the year can be readily found, without reference to any calendar.

It is as a citizen and not as an astronomer that I am interested in this reform. The astronomer can work independently of any calendar and makes much use of a system of reckoning called the Julian Day reckoning, that is never employed for ordinary everyday purposes. He numbers days consecutively from January 1, 4713 B.C. Thus, for instance, Julian Day 2428900 began at Greenwich mean noon on January 1, 1938. A simple table enables him quickly to derive the interval of time, in days, between any two dates within the period of historical chronology, which is what the astronomer is primarily concerned with. By using the Julian Day reckoning, the astronomer sidetracks all the inconveniences of the present calendar; he would still continue to use this reckoning because of its great advantages for his special needs, if The World Calendar were adopted.

I welcome this opportunity of making it clear that astronomers, so far as their scientific work is concerned, can have no objection to calendar reform. But as citizens, with many interests in common with other members of the community, they are not indifferent to schemes of calendar reform. They may take, perhaps, even more interest in such schemes than the average member of the community because many astronomers feel that they have, historically, a vested interest in all that pertains to the calendar. Many of the foremost astronomers in all countries have expressed themselves in favor of The World Calendar. I am personally in favor of this plan, including the stabilization of Easter.

TOMORROW BUILT ON TODAY

By THE HONORABLE DAVE HENNEN MORRIS

Member American Advisory Committee, The World Calendar Association, Former United States Ambassador to Belgium

WITH world conditions confused and troubled, with wars and possible wars disturbing the thoughts of men and women everywhere, it becomes increasingly urgent for the world to foster endeavors which palliate such discordant conditions. In such activities lie possibilities for understanding and peace, and among them belongs calendar reform.

For many years I have been actively interested in the movement for a world language, one that is simple in structure, precise, easy to learn, and free from hidden prejudices and misunderstandings in the meaning of its words. Because of my desire to further greater understanding and unity among all people, I have also been increasingly interested within the past few years in the movement for improving our antiquated and inadequate calendar.

When we examine the Gregorian calendar and observe its handicap of irregularity, inequality and variability we cannot but wonder why it was not changed long ago.

In ages past, we achieved in a very admirable way the counting of our day-time (the clock) in a regular, ordered, equal and stable manner. Now we begin to see that these same fundamental characteristics can also be applied to our method of counting year-time, the calendar.

The present movement for calendar reform is nothing new; it is more than 100 years old. It started in 1834 with the Catholic priest, Abbé Mastrofini, who advocated a 364-day year and first conceived the idea of treating the last 365th day and the 366th leap-year day as extra "intercalary days." Agitation for the Mastrofini idea continued after his death, and received new and energetic leadership in 1887, when the famous French astronomer, Camille Flammarion, as President of the French Astronomical Society, offered two prizes for the best plan for a new calendar. It is noteworthy that both prizes were awarded to revisions based on a perpetual calendar of 12 months with equal quarters.

In 1900 calendar reform received the favorable attention of the Evangelical Conference at Eisenach. With church and science having thus paved the way, the International Chamber of Commerce and other important groups went on record as steady and persistent advocates.

Early in 1914 Switzerland started a still more official study of the subject, which was cut short unfortunately by the outbreak of the World War. After the war, in 1919, the International Astronomical Union nomi-

nated a committee to study the reform and three years later it presented its findings, advocating a 12-month, equal-quarter revision including the intercalary days.

With the forming of the League of Nations the international consideration of calendar reform began on a sound and more extensive basis, resulting in the calling of an International Conference in 1931 at which 44 countries were represented. At this conference, agreement was reached in favor of a fixed Easter and in favor also of the general principle of calendar reform.

Six years of study and research followed, when in 1937 the Chilean Government took the initiative by presenting a draft treaty to the League of Nations for the adoption of a 12-month equal-quarter plan, known as The World Calendar. Within approximately six months, 14 nations joined in supporting the Chilean proposal. Unfortunately the League did not feel itself free to go beyond the mere confines of reporting the answers received to this proposal.

The next step now appears to be the independent calling by one nation of an international convention to deal with the question toward which our studies and preparations should lie.

In the past the United States has on notable occasions taken the lead in calling for world cooperation on international matters. So it would be in accordance with the traditions of the American Government to take the initiative in such a constructive movement. Advocates of calendar reform believe the time is rapidly approaching for the United States Government, through its President, to appoint a special committee for the express purpose of studying and reporting officially on The World Calendar, with a clear exposition of its influence upon civil life. Upon the committee's findings would then be based the recommendation to call an international meeting on this question.

With this brief history of the calendar reform movement, let me touch upon a few of the outstanding advantages by which The World Calendar has appealed so forcibly to me. To begin with, it is a mechanism for international use upon which all nations may agree without its being to the special advantage of any one. Time is one of the few things we have which is fundamentally the common property of all.

Under this reformed system we shall enjoy a simplicity, and stability in timing our daily affairs such as we have never known before. In this unsettled and disordered world anything that is marked by harmony and balance ought to be welcome indeed. The two intercalary days of The World Calendar plan, as international holidays, appeal to anyone who has the interest of a many-peopled world at heart. These are no patriotic holidays restricted to one race or one nation or one group only, but are constituted especially for the common good of all. It is hard to believe

that a world, often at variance, cannot feel itself drawn together by the joint observance of these two universal holidays dedicated to world amity and cooperation and a greater feeling of oneness among us all. And the signal fact that in this World Calendar plan the various time-units, whatever their individual functions, all come together at specific intervals in perfect agreement with each other, marks a great step forward in the unity of the calendar, without in any way detracting or losing the individuality of its several parts. Out of many parts one harmonious whole is the result, which strikingly suggests our own motto, "E Pluribus Unum."

A new civil calendar is greatly needed now, one which is more appropriate to the modern day and age under which we live. Once the present obsolete system is replaced by the new World Calendar with its inherent harmony, order and stability, who knows what beneficial influence may be felt upon our world from these desirable qualities? Thus calendar reform becomes a duty of intelligence which few of us can ignore or neglect.

Our todays would then more surely pave the way for better tomorrows, for it is our todays upon which our tomorrows are built.

OBITUARY NOTES

MARTIN BURRELL, four times a member of the Canadian Cabinet, and since 1920 Librarian of the Parliamentary Library in Ottawa, died on March 21, aged 79 years. He was one of the last of the dwindling group of statesmen who guided Canada's destinies during the World War. Long interested in calendar reform, he wrote shortly before his death an article on this subject, which is reprinted in this issue of the *Journal of Calendar Reform*. Mr. Burrell's work as an author had won him a place in the first rank of Canadian literature, while as a raconteur and speaker he was regarded as one of the wittiest and most brilliant men in the capital. He was born in England, coming to Canada in 1883.

DOCTOR WILLIAM WALLACE CAMPBELL, astronomer and former President of the University of California and the National Academy of Sciences, died in San Francisco on June 14, aged 76. For 29 years he was Director of Lick Observatory, whence he journeyed to every part of the world in pursuit of solar data. He had been made an honorary member of almost every important scientific society in the world and had received honors and decorations from many countries. While he was at Lick Observatory, the need for an improved calendar drew his attention and he began writing and speaking in advocacy of revision.

OTHER deaths among the membership of The World Calendar Association during the past few months include *Holger Rosman*, of the Chamber of Commerce of Stockholm; His Eminence *Luigi Cardinal Capotositi*, Rome; *Arnold J. Gantvoort*, music authority; *Dr. Elias P. Lyon*, former Dean of the University of Minnesota Medical School; *Frederic E. Ives*, inventor of the half-tone engraving process; *Merton E. Lewis*, former Mayor of Rochester and State Attorney General; *Rev. Conrad E. Hermsted*, Bethlehem, Pa.; *Rev. Edward S. Worcester*, New Brunswick, N. J.; *Prof. H. E. Slaught*, Honorary President of the Mathematical Association of America; *Francis Edward Powell*, President of the American Chamber of Commerce in London; *Elmer P. Kohler*, Professor of Chemistry at Harvard University; and *Knut Wallenburg*, Swedish Foreign Minister during the World War.

NATIONS' OFFICIAL REPLIES

NINE months ago the League of Nations published the official replies of 32 nations to the League's "circular letter of inquiry" regarding calendar reform, which were published in the October, 1937 issue of the Journal of Calendar Reform on pages 130-134. Since that time 13 additional nations have filed their responses. They are Afghanistan, Austria, China, Ecuador, Guatemala, Haiti, Iraq, Lithuania, Monaco, New Zealand, Turkey, Uruguay, and Venezuela.

Our readers will recall that governments were asked to express their opinions regarding the Chilean proposal for a draft treaty on calendar reform, approving The World Calendar. The League has summarized the 45 replies as follows:

14 states accept the Chilean proposal in principle.
6 states declare themselves definitely opposed to the proposal.
9 states offer no remarks.
9 states cannot define their attitude for the moment.
7 states consider the reform appears to them premature.

The 13 additional governments replying answered as follows:

Afghanistan (November 22, 1937)
The Afghan Government would be prepared to adopt and to use for external correspondence the reformed calendar should it be accepted by the other States members of the League of Nations, while reserving the right to use the solar year of the Hegira as the official year in the interior of the country.

Austria (September 4, 1937)
In the opinion of the Federal Government of Austria, calendar reform would certainly be desirable from the point of view of the interests of commerce, industry and communications. However, such a reform and the fixing of religious feasts, such as Easter, are indissolubly linked together. The Austrian constitution does not give the Federal Government any power to exert its influence on the fixing of the date of religious feasts by the churches. On the contrary, the Federal Government has undertaken, by the Concordat, to respect the fixing of the feasts of the Catholic Church, and consequently also the subdivision of the year arranged by the Catholic Church. Thus the introduction by the State of a secular calendar differing from the religious calendar as set up by the Catholic Church could not be taken into consideration.
In these circumstances the Federal Government would be unable to tackle the problem of the reform of the calendar until the Catholic Church had, in its religious domain, found a solution for the questions connected therewith.

China (September 13, 1937)
The Chinese Government is in favor of the reform of the calendar and agrees in principle to the provisions contained in the draft Convention communicated by the Chilean representative.

Ecuador (April 15, 1937)
The Government of Ecuador will examine the draft Convention relating to calendar reform with a view to making what observations it considers pertinent. These observations will be communicated to the Secretary-General in due course.

Egypt (November 23, 1937)
Supplementing previous answer: The competent authorities to whom the draft Convention was submitted have no observations to make.

Guatemala (August 25, 1937)
The Government of Guatemala is proceeding with the examination of the draft Convention relating to calendar reform communicated to it on March 12, 1937.

Haiti (September 29, 1937)
The Government of Haiti does not wish, so far as it is concerned, to abandon the Gregorian calendar.

Iraq (October 19, 1937)
The Iraq Government has no observations to make on the draft Convention. Nevertheless, it views the project for the reform of the calendar with much interest and wishes to be supplied with any observations which the other States members of the League of Nations may make on the subject.

Lithuania (September 2, 1937)
The Lithuanian authorities concerned, to whom the draft Convention relating to calendar reform has been referred for examination, have not yet been able to give their opinion on the matter.
As soon as the studies have led to definite conclusions, the Lithuanian Government will bring them to the Secretary-General's notice.

Monaco (September 3, 1937)
The Government of H.H. the Prince, after having carefully examined the draft Convention relating to calendar reform communicated to the Council by the Chilean representative, is of opinion that no proposal could be made as long as the agreement of all countries on the question of the stabilization of the Easter festival has not been realized.

New Zealand (September 14, 1937)
The New Zealand Government concurs in the views expressed by His Majesty's Government in the United Kingdom in regard to the draft Convention relating to calendar reform.

Turkey (January 7, 1938)
The Government of the Republic considers that all the provisions contained in this draft, especially those having in view the adoption of the perpetual calendar of twelve months and equal quarters, are in every way in keeping with the requirements of the century. It therefore sees no objection to the proposed calendar being adopted on January 1st, 1939.
In order to arrive at a general agreement, Turkey is in favor of an international conference meeting under the auspices of the League of Nations, which conference would open this year, and at which the whole question of calendar reform would be discussed, in the light of the results obtained thanks to the remarkable work hitherto carried out, and always on the basis of the draft Convention put forward by the Delegate of Chile.

Uruguay (August 9, 1937)
The Government of Uruguay has resolved that its delegates to the Assembly of the League of Nations shall support the proposal presented by the Governmnt of Chile on calendar reform.

Venezuela (August 28, 1937)
The Venezuelan Government has no observations to make on the proposed reform.

One cannot fail to note that China in spite of being torn by war found time to reply favorably to a reform movement that invites greater world cooperation, amity and good will. Spain, it may be recalled, was yet another

state that notwithstanding her serious internal conflict studied the subject competently and replied: "The solution (World Calendar) now put forward is superior to all others suggested."

The League of Nations was very careful to point out that the decision reached in September, 1937 was a *mere postponement* of the International Conference which will be necessary to record general acceptance of reform. It is needless to say the League Council can take up the question of calendar reform again at a moment's notice on the initiative of any member nation. The way also is left open for any individual nation to take the initiative and call an international conference.

The next act in the history of calendar reform is to stimulate clearer and more authoritative action among individual nations and leaders of national and international groups in the respective nations. Every year the trend to a more rational order of Time grows wider and deeper, and the churches, the educational authorities, the representatives of scientific, professional, industrial and commercial opinions who advocate reform will not fail to make their wishes known.

NEW WORK ON CALENDAR REFORM

AN Italian publishing house has just issued a book by the Catholic scholar, Canon Francesco Raspino, entitled "Studies in Computation of Time." The author advocates adoption of a calendar which is substantially The World Calendar, laying particular emphasis upon the merits of the proposed Year-End Day as a stabilizing factor. The book is published with full ecclesiastical approval.

Copies of the book are not on sale in America, but a review in *Il Popolo* of Turin says: "Here is a work that deserves to be read with sympathy. Its full title includes the phrase, 'A Proposal for a Perpetual and Invariable Roman Calendar.' The author lays the foundation for his proposed reform with a discussion of the astronomical background of the calendar and its early history. He describes the evolution of the calendar up to the time of Pope Gregory XIII, and then pays tribute to the masterly achievement of that pontiff, whose calendar is used today by all civilized people throughout the world.

"The Gregorian reform achieved a notable degree of perfection in time measurement, but it did not eliminate all the inconveniences and inefficiencies from the calendar. After serious study, the author gives his recommendations for further improvement. He discusses of course the advisability of altering the beginning of the year to conform with astronomical accuracy. He indicates that ecclesiastical authority would not be averse to a fixed Easter.

"Those who would like to know more about calendar reform should most certainly read Canon Raspino's book, and all its readers will find it interesting and instructive."

OUR CALENDAR: WHAT'S WRONG?

Address before the Ohio Federation of Women's Clubs
Columbus, Ohio, April 12, 1938

By ELISABETH ACHELIS
President, The World Calendar Association

TWO questions are frequently asked us regarding calendar reform. Why do we want calendar reform? And why do we want it now?

We are all interested in modern improvements and conveniences, and when we discover that which is faulty or no longer adequate, we strive for something better to replace it. We are, therefore, all aiming to improve and correct undesirable conditions and to find the simplest, most direct and most efficient ways by which our daily lives are made happier and more in keeping with our day and age. That is common sense.

We have, as you know, improved heating plants and electrical appliances to save the wear and tear on labor and to ease in part the physical and mental strain that our modern civilization puts upon us. The telephone has drawn people closer together than was possible with the old-time messenger on foot or on horseback. The radio is bringing us the news of today while it still is in the making, with amazing swiftness and convenience. Furthermore, we are improving athletic facilities, encouraging wholesome sports and activities, bettering entertainments in theaters and in motion pictures, and awakening the cultural outlet of people everywhere, thus providing up-to-date recreation as well as work.

With all of these modern improvements and discoveries of such benefit, does it not come as a shock to realize that we are still living under a calendar that is more out of date and inconvenient than were the old-time sailing vessels and the tallow candles? And when we consider that our antiquated calendar touches our everyday life, it is incredible to believe that the world could be so lax in this respect. For no plan is made, no event recorded, no letter written, no newspaper read, and no appointment arranged without our consulting the Gregorian calendar. We use it constantly.

Well, what are the defects of the calendar?

The first defect, we might say, is the unreasonable difference in the lengths of the months, so that we can never remember which month has 31 days and which ones are shorter without the familiar nursery rhyme or counting the knuckles on our hand. Our calendar, you know, has seven months of 31 days, four of 30, and one of either 28 or 29, depending upon what year it is. This gives us unequal quarter and half-years, a hindrance and an injustice to the business and financial world. In addition, the 12 months always begin and end their cycles on different weekdays. We never

know, for instance, the weekday for the first of any month unless we first look it up in the calendar. Any kind of comparability is quite impossible. And all these defects are the direct reason for our calendar being such an inconstant system, the outstanding characteristics of which are irregularity, inequality, discord, and instability.

Who knows on what day the new year will begin? Is it on a Sunday or a weekday? And who knows on what weekday Independence Day or Christmas Day falls this year? Now all this uncertainty is a handicap. It interferes with the ease and smoothness of our very lives.

The old calendar always seems to me like an unhappy and badly adjusted family. The youngest child, the day, always runs away from the months so that the months never know where to find this child. The week, a rather recent newcomer in our civil calendar, feels its importance, whereas the month claims it is the more important child of Father Time. But the seasons insist on their claim to leadership, because they are the basic units of the calendar year. The quadruplets in the family—the quarters—differ so much in length that one never knows how many days they have. Then there is the small first half of the year constantly complaining about the injustice done it, because the second half-year is so much longer. And so Father Time, worried and harassed, rests his weary head and mournfully exclaims: "Why do my children quarrel so? No wonder the world is confused and unhappy with my children in constant disagreement."

With such complete lack of harmony and order in our time system, is it to be wondered at if people are equally confused, and home and business life are equally unbalanced and irregular? For we have seen that we do nothing without considering day and date, and the influence these exert, either beneficial or detrimental, is incalculable. Were our present calendar to be offered to you and me today as a new device, it would be rejected as utterly impracticable. Business, education, science, religion and society would just not have it.

No lawyer or jurist would accept the calendar of today, which is so fluctuating and so unbalanced in arrangement. For what is more confusing than the many words used in law when it wishes to designate a particular day: "the first Tuesday after the first Monday in November," meaning Election Day?

Business would veto it on the ground of its inconvenience and irregularity, lacking in all order and system, and therefore not even deserving a trial. Scientists would decry it as much too changeable in arrangement, quite unequal to the exacting method required in their many calculations.

Economists would denounce it as being far too clumsy a calendar to figure with, as it necessitates long and complicated tables of computation, which is an unnecessary waste of time and labor. Statisticians would not

consider it, because the various sections in our calendar are not comparable, and comparability is fundamental to statistical work.

Education would ridicule it as an erratic thing, not worthy of serious attention from the world of learning, because of the ceaseless trouble it causes to spring, summer and Christmas vacations, as well as to the school year. Religion would reject it as too burdensome for clergy and laity with its meandering feast-days.

Society would discard it as complicating the arrangements of social dates and engagements, with month-dates and weekdays never agreeing from month to month or from year to year. Club members and officials would scorn it as too impracticable for use in planning yearly, monthly and weekly meetings and programs.

And producers of such entertainment (as theaters, motion pictures, concerts) would oust it on the ground that making dates ahead is too difficult in such a constantly changing calendar that knows no stability in its arrangement.

Yet notwithstanding all these avowed objections, lawyers and financiers, industrialists and laborites, scientists and educators, statesmen and clergy, society clubs and theaters, all are obedient slaves to just such an illogical calendar as ours!

I think you will agree with me, then, that a real need exists for an improved calendar. It is a very natural beginning, when we consider how very closely the calendar is allied to all our many activities, regardless whether these be in the outside business world or in our more personal home life. For all our activities are interrelated. It has truly been said that the calendar binds and unites the whole world. Time, as we know it in the calendar, makes us all kin and rich or poor use it without favoritism or disparagement. Like time itself, it is free for the use of all.

With all the defects and objections, then, why has our calendar not been reformed long ago, in keeping with our modern day and age?

Well, it is easy for people to get accustomed to old ways, and to let things slide along. There are so many things to think about, that if no one calls attention to a particular matter, it is just left to take care of itself, and we all know what happens when things are allowed to take care of themselves. Drifting makes things go from bad to worse. Apathy produces a state of mind that is very close to stagnation, and apathy toward calendar reform is its greatest obstacle. If apathy can be replaced with a realization that calendar reform belongs to our modern lives, the world will soon take this progressive step for reform that will aid, among other means, to bring about better days. I believe you will agree with me that what should have been done long ago should be delayed no longer. Henceforth it becomes a duty and an obligation, does it not, for every one of us to be ready to do his and her part in bringing about this movement so that

civilization can enjoy *better days through a better calendar?* And this can be done very simply.

But before we explain how, let us find out how the present calendar got out of step with life. Looking back for a minute to one of the oldest civilizations, we recall that the ancient Egyptians abandoned the moon as the traditional time-keeper. In its place they accepted the sun as more reliable because upon the sun depended the regular recurrences of the seasons, so essential to the vegetation on earth. The Egyptians had a 360-day year, with five extra days tacked on the end. This reform was adopted 6,174 years ago. Forty-two centuries later, in 46 B.C., the Romans undertook another reform. They kept to the 12-month year, but discarded the five end-days of the Egyptians, distributing them more evenly throughout the year. They also incorporated in the calendar for the first time the novel leap-year rule, made necessary to take care of the quarter-day at the end of the 365-day year. However, some time later, the months were all reshaped in arrangement and given all sorts of unreasonable lengths to suit the whim of the Emperor Augustus. Constantine the Great, an ardent convert to Christianity, introduced a new time-unit into the civil calendar, namely, the Biblical 7-day week. And this occurred in 321 A.D. He furthermore transferred the sacred and traditional Sabbath, as the day of worship, from Saturday to Sunday, in holy memory of the Resurrection. Then some twelve centuries went by with the Julian calendar in use throughout Europe. However, the Julian calculations regarding the length of the year were slightly inaccurate, and the calendar went more and more astray until by 1582 A.D. it was nearly two weeks out of line with the seasons. So Pope Gregory XIII, by an edict, boldly dropped ten days from the calendar in order to adjust it once more to the solar year.

We see, therefore, that there have been four great reforms of the calendar since the days of its Egyptian beginnings. The four reformers were Julius Caesar, Augustus, Constantine and Gregory. Now a new and fifth reform is being discussed. This reform will prove, we fully believe, another notable milestone in the evolution of our civil calendar. As we all share time and the calendar, we can also share in modernizing it and fitting it more aptly to the civilization in which we live.

This new reform, advocating The World Calendar, does not call for any new month or the loss of one, nor will it make us days older by a stroke of the pen. The World Calendar is nothing so revolutionary. It keeps to the twelve months, just about as they are, but it rearranges their length sensibly and regularly, making it possible for every new year not only to begin on January 1st, but also to start at the beginning of the week, Sunday. Month-dates and weekdays will correspond as was never possible in the old calendar. For example, let us take your city, Columbus. I was reading the other evening (in the World Almanac) that on February

21, 1818, it was given the name it now bears by the Ohio legislature. If the people of Columbus would like to commemorate their city's anniversary they might be interested to know that under this new perpetual calendar that date (February 21) would always fall on Tuesday, no matter what the year.

Of course the new World Calendar favors the placing of holidays on Mondays whenever this is feasible, and we are in complete accord with the Monday Holiday movement. We should realize, however, that no Monday holiday on the actual anniversary of the event is possible in the wandering calendar that we have today. Lincoln's Birthday, for example, could be observed on the Monday nearest February 12th, but in such a celebration the date might actually be either one to four days previous to the 12th and from two to three days after that date. A fixed Monday holiday with its date on a fixed Monday is possible only in a perpetual calendar where, for example, December 25th, Christmas, would always fall on Monday. In the new stabilized World Calendar Lincoln's Birthday would fall on Sunday and, according to our American custom, would be observed on the following day, so that the advantage of a Monday holiday in the new World Calendar is obtained without any difficulty. As I have already said, this is only possible in a perpetual calendar.

Another valuable factor in this new reform should appeal especially to us women. Every child's birthday or any other event would always be observed on the actual weekday upon which the event first took place. A Sunday child will always have a Sunday birthday, and that is true with any other day of the week. Your wedding on Wednesday, Thursday or Saturday—chosen for a particular reason—will always fall on the same weekday so that anniversaries in the future would not only commemorate the date, month and year, but the day of the week as well. Anniversaries become for the first time true and accurate commemorations, with the previously forgotten day of the week coming into its own.

Yet there is a more practical advantage. When the bank lends you money for 90 days, that is considered as three months and also a quarter-year. In our present calendar the 90 days is a quarter-year only in the first quarter or beginning of the year. If you want to borrow money for 90 days in the autumn, you will find the quarter is 92 days long and there is something decidedly wrong somewhere. Similarly, if you should receive your income or interest on your securities by the quarter-year you will have to stretch your money two days longer in the Fall and Winter quarters than you do in the spring. Under the new World Calendar system a quarter-year, any quarter-year for that matter, is always 91 days long or 13 even weeks or three complete months.

During my talk, some of you who have been looking at the chart of the new World Calendar have been noticing that extra day at the end of

the year—Year-End Day. But this is nothing new that has been added to the year; it has always been there. It is still December 31st, or the 365th day of the year, only with another name and another function.

With this day, all the quarters in the calendar can be made equal and every year can be exactly like the one preceding or following it. This Year-End Day, in a word, is the "day of passage," the passing over from the old year to the new. Practically speaking, it is the stabilizing day, just as we have the gyroscope which stabilizes our airplanes and our steamers. New Year's Eve, as it were—the last day of December plus Year-End Day on an extra Saturday—is nothing new or startling. All of you who have traveled to the Orient know of the International Date-Line out in the Pacific. As you cross it coming east to America, you have to observe a second day, repeating the day before, so as to keep yourself in time with the rest of the world. Such a second or double day, as it is used in The World Calendar, is not unusual and has even a religious significance, according to Rabbi Martin M. Weitz of Kenosha, Wisconsin, when he writes: "Orthodox Jewry celebrates eight and not seven days for Tabernacles and Passover, and two, not one, for New Year and Pentecost, in order that Jewry all over the world shall be able to celebrate these festivals simultaneously." And the Year-End Day in the proposed new calendar has been approved by other religious authorities; among them Archbishop Germanos of the Greek Orthodox Church (who, by the way, married the Duke and Duchess of Kent) and Bishop Manning of New York. Two other notables are Abbé Chauve-Bertrand of France and the late Abbot Cabrol of England.

This Year-End Day would be expressly designated as an international holiday to be observed all over the world, and as such is a decided bond between nations. It could be a day of world amity and cooperation. Another international holiday would be the Leap-Year Day that comes every fourth year. In contrast to the present incongruous attachment of Leap-Year Day to February, it is placed in the middle of the year after the second quarter, just as Year-End Day comes after the fourth and final quarter of the year. This arrangement balances the calendar and makes it stable (every year the same). These days are not a part of any quarter but are *connecting links;* in one instance between the equal two halves of the year every four years, and in the other, between the old and the new year each year.

Some anxiety has been expressed that the New Year's Eve celebration on Saturday preceding Sunday would run so far into the early morning hours of Sunday that this day would be desecrated thereby. I do not think so. There is a curfew law in New York State that liquors or alcoholic beverages cannot be purchased after 3 o'clock Sunday morning. A similar law can be enacted so that the celebration on Year-End Day in public

places must cease by 1 or 2 o'clock on Sunday morning. People who wish to make merry can do so the day preceding, Saturday, December 30. The international holiday or Year-End Day follows immediately after. The actual New Year's Day, Sunday, January 1st, would be intensified as a spiritual day, a fitting beginning, don't you think, for every new year? It was Rabbi Stern of New York who stressed in a recent sermon that what the world needs today is a "spiritual stock-taking," which he said "is as necessary each new year as a fiscal balancing of accounts." By considering Year-End Day as an international day of good will and co-operation, immediately followed by Sunday, that "spiritual stock-taking" day, the new World Calendar is both practical and ideal.

The arrangement of days, weeks and months not only gives us a balanced calendar, but the first in which all the time-units—days, weeks, months, quarters and half-years —are perfectly federated one with another. That is, each has its own function and importance (somewhat like a State in the Union), with each being a definite part of the whole, without which the latter would be incomplete. In the new World Calendar, at the end of each quarter we round out a full number of days, weeks and months in perfect harmony.

A while ago, at the beginning of this talk, I accused our present calendar of disorder, inequality, instability and discord. I think these few remarks have served to show you that the new World Calendar is free from these faults, in that it establishes order, harmony, equality and stability. It requires, as has been said, no major operation and could be introduced with a minimum of change. Because of its advantages, it has received the support of nations, statesmen, educators, religionists and all forward-looking people. Assuredly, such a calendar deserves a careful consideration from everyone interested in world progress.

A movement such as this has its roots in just such groups as the one which I have the pleasure of meeting here today. World-wide activity, like a tree, draws its strength from its roots. That is why it is essential for a group such as yours to voice its opinion and to go on record in support of this movement. Such support could take the form of a resolution which would act as a stimulus for other State Federations of Women's Clubs to follow, paving the way for the General Federation to take final action. For you know, the General Federation of Women's Clubs is making an extensive study of this question, and the opinion of its state member federations would be of inestimable value toward reaching its conclusion.

Your State of Ohio as a whole may also become a valuable factor—even a leader—in American cooperation. Only as the States in our Union and our nation, together with other nations, concentrate for progress do we have national, international or world progress. Our nation at large, being a democracy, obviously takes the stand which its States and citizens have taken. They naturally lead the way for the government to follow. It is not unreasonable to expect that Ohio, the State which has given such a notable number of Presidents to our country, should be willing to apply that same leadership to calendar reform. I should like to close with this opinion, and I am confident that the consummation of the new World Calendar is not far off. It can be made effective either on December 31, 1939, or on December 31, 1944.* We firmly believe that this reform is one of those "events toward which the whole creation moves."

*These dates (Sundays) would be considered as extra Saturdays in The World Calendar and allow the New Year to begin with Sunday, January 1.

AS VIEWED BY LONDON TIMES

Readers of the Journal of Calendar Reform have asked us to reprint for permanent reference, two noteworthy articles on calendar reform which were printed a few months ago by the London *Times*. The first article appeared on the editorial page of the *Times* Weekly edition, directing attention to a more extensive article in the Literary Supplement, which reviewed at considerable length two books published in London—P. W. Wilson's "Romance of the Calendar" (Allen and Unwin), and Miss Achelis' "The World Calendar" (Putnam).

(From London *Times* Weekly Edition)

THE *TIMES* LITERARY SUPPLEMENT in its current issue (Aug. 1937) reviews two new books on the past and future of the calendar. The learned authors both advocate the reform of the calendar. One of them, indeed, Miss Elisabeth Achelis, is President of The World Calendar Association, and in this connection the words "World Calendar" indicate a particular scheme of reform. The other, Mr. P. W. Wilson, is also an advocate of The World Calendar. The League of Nations has been discussing the reform of the calendar, on and off, for some fifteen years. Now, therefore, is the time to read these two books and to resolve for or against their suggestions.

Fortunately, the mathematical problem does not demand the brain of an Eddington or of a Whitehead. The earth takes 365¼ days to move around the sun. Therefore in every fourth year the odd quarters have to be put together and dropped in as a whole extra day. The number 365, moreover, is not divisible by 52, the number of weeks in the year; there is one day over; and therefore if January 1st is a Sunday in one year it will be a Monday in the next, and no day of the week falls always on the same day of the year. The months, again, are arbitrarily unequal in length—it was Augustus Caesar, we are told, who planned it so. And, to complicate matters, some calculations, and notably that of the date of Easter, are based not on the sun but on the moon, which has a month, all its own, of 29½ days. The uncertainty of the date of Easter, which may fall on any one of no fewer than 35 days, is only the greatest of many sources of confusion. No month can be counted upon to have the same number of Sundays in it every year. Christmas Day may fall on any day of the week. The working days in the same quarter vary in number from year to year; and the quarters therefore cannot be compared together for statistical and accounting purposes.

The remedy is simple, up to a certain point. A suggestion for a year of 13 months of 28 days each, with one extra day, has lost ground of late; it was never much liked in England, where the number 13 is still widely

feared. The proposal now in favor, The World Calendar, is for a year of 364 days divided into four quarters of 91 days each, each quarter consisting of one month of 31 days followed by two months of 30 days each. The 365th day would come at the end of December, but would have no number in the month, and no name in the week. It would be a holiday. Once in every four years a similar day would be put at the end of June. Symmetry and regularity would result. The first of January would always be a Sunday, and so throughout the year. Christmas Day would always be on a Monday, which would be a great advantage to the holiday-makers; and finance, commerce, and industry would benefit by the simplicity of reckoning, the regular recurrence of periods of work and of rest, and the stricter correspondence between the quarters in one year and every other year.

So far as that part of the reform is concerned, the opposition in this country is not likely to be acute. Opposition to so much of the scheme as we have yet considered would come, on grounds which it is no condemnation to call sentimental, from people who have a natural love of a little excitement and change and do not want to have Christmas Day always on a Monday, nor their birthdays on the same day of the week every year. The stricter Jews might also find some little difficulty in adjusting their seventh day to a calendar in which there was one day every year, and in every fourth year two days, which the Christian world left out of count.

But one very important matter has yet to be faced. The whole scheme would break down, so far as commerce and industry were to gain advantage from it, if the Easter holiday remained movable. Easter—for other besides religious reasons—must be stabilized, fixed to a particular Sunday and a particular date in the year. That has been accepted in Great Britain in principle by the passing of the Easter Act of 1928; but that Act has never been put into operation because the general assent of all Christian communions is required to make it practicable. The giving or withholding of that assent will make all the difference.

(From London *Times* Literary Supplement)

CIVILIZED man regulates his life so firmly by the calendar, and at so many points, that it becomes for him part of the settled order of things. He seldom reflects that the particular calendar by which he lives is not the only possible one; and any idea of change or reform comes to him as a shock. The Gregorian calendar, which is the one by which most civilized activities are now dated, is so good that we hardly ever remember that it might be made better. Yet, in fact, it has its weaknesses, and there have for many years been suggestions of reform. These have been the subject of discussions by the League of Nations since 1922, and there is now a proposal for a reformed calendar to come into operation on January 1, 1939. This situation has called forth the two volumes now under review.

Miss Achelis is President of The World Calendar Association, and her book is a collection of addresses which she has delivered before various bodies since 1930. Some of them are historical, but the majority consists of direct pieces of advocacy dealing with difficult aspects of the proposed reform. Mr. Wilson is also an advocate of what is known as The World Calendar; but he has attempted a more general treatment of the subject and one which goes more fully into the history of the Gregorian calendar and of other calendars also. Only in his last chapters does he come to the question of reform, with which he deals persuasively, stating fairly both advantages and disadvantages.

The history of calendar evolution has been that of a struggle between the influence of the sun and that of the moon. A calendar may be constructed upon the lunar month, the 29½ days which it takes the moon to move round the earth; or one may be constructed upon the solar year, the 365¼ days which the earth takes to move around the sun. The former period is the easier to observe accurately, and the month is therefore the more primitive conception. But any calendar which is founded upon the lunar month inevitably gets out of step with the march of the seasons; and man has an instinctive feeling that spring, summer, autumn, and winter should occur year after year at the same points in the calendar. Therefore, as Mr. Wilson puts it, the problem has always been "How are we to adjust mundane days to lunar months and solar years? How are we to arrange lunar months also within solar years?" At each step there are fractions to be adjusted, and throughout civilization the tendency has been to simplify the position by using only the earth and the sun—that is to say, the day and the year—as exact units of time, and to reject the lunar measurement while retaining an artificial month as a convenience. Once more to quote Mr. Wilson: "In forming a calendar we need the day, the month and the year. But this does not mean of necessity that we need the earth, the moon and the sun. We can retain the rotation of the earth as a measurement of the day. We can retain the orbit of the sun as a measure of the year. But we can reject the satellite orbit of the moon as a measure of the month. We can arrange months in the year to our own convenience."

It is as a result of this tendency that the Gregorian calendar has come into existence, and if any further changes are introduced they will not, we may be sure, contradict this principle. The calendar we use today is descended, through comparatively few stages, from that of Rome as established by Numa Pompilius in the Eighth Century B.C. There were then already 12 months, and ten of them bore the names they now bear. But the months were lunar months; and since Numa saw very well that a year so composed would need constant adjustment he laid the duty of adjusting it upon the College of Pontiffs, who made of the business a mystery which was jealously guarded until about 304 B.C., when Cneius

Flavius dared to publish its solution to the world. The great advance, however, came with Julius Caesar, who in B.C. 46, under the advice of the Alexandrian astronomer Sosigenes, abandoned the lunar year and adopted a civil year of 365 days, with an extra day each fourth year to make up for the additional quarter of a day in the solar year. He also added to the calendar a name which it still retains, July, for the month which had previously been called Quintilis.

Apart from the gradual supersession of the clumsy Roman subdivisions of the month, and the adoption of the seven-day week, only two further changes turned the Julian calendar into that of today. The first was made by Augustus Caesar, who rectified a misinterpretation of Julius Caesar's leap-year provision and, less happily, varied slightly his great predecessor's arrangement so as to give to each month the number of days it now has. He also named the month which we still call August after himself. The second and last alteration was not made till 1582, when Pope Gregory XIII adjusted the working of the Julian calendar. His intervention was necessary because the solar year, as calculated by Sosigenes, was 11 minutes 14 seconds too long. By 1582 the calendar was 10 days ahead of time. Gregory ordered 10 days to be dropped, so that October 4, 1582, was immediately followed by October 15th, and he also adjusted the incidence of leap year so as to give a year which is, on an average, within 26 seconds of what is now calculated to be the true solar year.

Since we have in the Gregorian calendar (which, incidentally, England did not adopt until 1752) one which is so remarkably accurate, what, it may be asked, is the necessity for further change? Briefly, it may be said that the case for reform is based not upon accuracy but convenience. There is, for example, the matter of "the drifting week"—the fact that January 1st was a Friday in 1937 and will be a Saturday in 1938 and so forth. It would surely be convenient if the same dates could fall on the same days of the week in every year. There is the varying length of the months and of the quarters. There is also (though this is a matter of the ecclesiastical rather than the civil calendar) the problem of Easter, the date of which is still ascertained by a calculation in which the moon plays a part.

The suggestion made is that these and other disadvantages might be remedied by adopting the proposed World Calendar, based upon the fact of 364 being a more easily divisible number than 365. In The World Calendar each year would have 364 days plus one additional day (the Year-End Day), which would come at the end of December but would not be given either a numerical position in the month or a day in the week in which it falls.* In leap year there would be a similar day at the end of June.

The sequence of the 12 months would not be disturbed, but the 364 days would be allotted so as to form four quarters of 91 days each consisting of one month of 31 days followed by two of 30 days. Thus the week would cease to "drift," and every year would begin on a Sunday. Moreover, every quarter would contain the same number of days, and every month the same number of weekdays (though not of Sundays), equalities which would, it is claimed, prove useful to statisticians, employers, wage-earners and others. Further, a fixed Easter (to which there appears to exist a minimum of opposition) could conveniently be adopted simultaneously with The World Calendar. In the course of his survey Mr. Wilson discusses many more calendars—Egyptian, Babylonian, Greek, Chinese, and Jewish among others—than are mentioned in this review, where only the main line of his argument has been followed.

ORDER IN THE *ORDO*

By THE ABBÉ CHAUVE-BERTRAND

Catholic priest and eminent international authority on the calendar

Translated by The Rev. Edward S. Schwegler, D.D.

THE *Ordo* is an ecclesiastical calendar used by the Church in the recitation of the Office and the celebration of Mass. Its more complete title is *Ordo Divini Officii Recitandi Missaeque Celebrandae*, "Directions for (Order of) Reciting the Divine Office and Celebrating Mass." Since a number of ecclesiastical feasts change their dates every year, and the dates of the movable feasts often conflict with those of fixed feasts, it is necessary to draw up a new *Ordo* every year, in which the new dates are given and any conflicts are adjusted.

In a certain French diocese the *Ordo* last year cost each priest 14 francs —an increase of 6 francs over the price of two years previous. The edition had 400 copies, and cost 14,000 francs. This meant that the cost per copy was 35 francs; so that, for each copy bought by individual priests, the diocesan authorities had to pay 21 francs.

In France, where the average book, unbound usually, might cost from 15 to 25 francs, 35 francs is a large sum for a book, and it is only natural that any means of reducing the cost of the *Ordo* would be welcomed.

Some effort was made in the French diocese whence these figures come, to reduce the bulk of the *Ordo* by omitting certain lists of years, as also indications of the lunation, dominical letter, Golden Number, etc. But these omissions did not hit at the root of the difficulty, which is the constant change in the calendar itself.

In *La Guestion de Pâques et du calendrier*, I have attempted to describe this root difficulty:

"From the liturgical point of view, we are obliged to put Septuagesima Sunday, and the Sundays immediately following it, sooner or later in the calendar according to the date on which Easter falls. As Easter occurs on March 22nd or April 25th, the two extreme dates, Septuagesima will be January 18th or February 21st (Ascension, April 30th or June 3rd, Pentecost, May 10th or June 13th). And then, the time after Epiphany (January 6th), which can extend to six weeks when Septuagesima is on its latest possible date, February 21st, is shortened to only two weeks if Septuagesima falls on its earliest date, January 18th. In the latter case, five Sundays bearing the title 'After Epiphany' cannot be celebrated between Epiphany and Septuagesima, so they are sandwiched in at the end of the liturgical year, between the twenty-third and twenty-fourth Sundays after Pentecost, somewhere in October or November. As a matter of fact, therefore, in certain years there are 28 Sundays after Pentecost, whilst

in others there are only 23. It is by such manipulation that the first Sunday of Advent, which must fall between November 27th and December 3rd because of its relation to the fixed feast of Christmas, is made to resume its proper place in the calendar each year.

"Besides this, it is necessary at times to transfer certain secondary feasts which are prevented from falling in their proper places by the occurrence on their dates of some movable feast. Thus, in 1934, Palm Sunday came on March 25th, feast of the Annunciation; and so the latter had to be transferred, in accordance with definite liturgical laws, to April 9th. It should also be noted that we speak here only of the feasts in the cycle dominated by Easter. Other modifications in the calendar and the *Ordo* are necessitated by the variation of the weekday in comparison with the date of different feasts. All these changes naturally upset the ecclesiastical calendar, and we are obliged to revise it each successive year."

One priest in each diocese usually has charge of getting out the *Ordo*. Inasmuch as different countries and different dioceses have various feasts of their own, the *Ordo* will vary from place to place. The man who is burdened with the task of making up the *Ordo* must spend quite an amount of time each year going through the calendar for the following year, figuring out the "occurrences" and "concurrences" of feasts, transferring festivities, noting "commemorations," etc. And often after the new *Ordo* is printed, he will probably be told, by way of compliment, that "there are really very few errors in the new *Ordo*!"

With all these difficulties in mind, one can easily understand what a boon a stabilized calendar, with unchanging dates and a fixed Easter, would be for all who have anything to do with the ecclesiastical *Ordo*, whether they make it up or merely follow it. The *Ordo* would be the same year after year. Each priest would need but one copy, and that copy could be used until it wore out.

At one printing, enough copies could be produced to last 10 or 20 years, thereby reducing even the initial and sole cost. Indeed, an *Ordo* would hardly be necessary, once the liturgical books were revised in accordance with the permanent calendar. Meanwhile, the present liturgical books could be used until, in the natural course, they would be replaced by new ones. If, for example, Easter came each year on April 8, it would merely be necessary to make permanent, with minor adjustments, exactly what we now do when Easter falls on this date.

If the *Ordo* contains, as it does in some places, a list of the diocesan clergy, this might be published as a supplement each year, or it could be put out independently, or printed periodically in religious journals.

There is no question, then, that the stabilization of the calendar, and so of the *Ordo*, would bring many advantages of simplification and unity, and that it would save a great deal of money, both to diocesan authorities and to the individual priest.[1]

[1] Translator's note. In the United States the printing of the *Ordo* each year does not seem to cause the difficulties or the expense it does in France. The *Ordo* usually sells for $1.00 which, for the size and quality of the little work, is a very modest figure. But all the advantages of simplification emphasized above would be present also in this country; and there would be a very definite saving in expenses. If, for example, the same *Ordo* could be used for a period of ten years, each priest would clearly save $9.00 in that period.

TIME IN OUR CHANGING TIMES

By Benjamin C. Gruenberg

Educator

"THE world is getting smaller," they say. And we all agree. California and England are each only a few days away from New York now instead of months away; a person in Chicago can speak to someone in Paris directly instead of waiting weeks for him to receive a message and several more weeks for an answer to arrive. Paradoxical as it may seem, the very forces that are shrinking the world are also making it larger. Advances in technology have brought the different parts of the world closer together. But they have also enabled many, many people to travel far from their home towns or to listen to voices from distant parts of the world over their radios. They have put people in touch with new cities, new landscapes, new ideas, and new music. For all those people, the world is getting larger.

Upon our time relations also, science, or technology, has wrought paradoxical changes. Labor-saving and time-saving devices have freed for us hours that were previously taken up by the business of keeping alive and earning a living. Yet we hear a great deal about the mad pressure and the wild tempo of modern life. So many activities and so many interests have been opened up to people that they try to crowd three hours' worth into every hour. They don't stop to consider which of two things they would rather do, which seems to be more worthwhile, but try with fierce determination to find time for everything. To some people, a few hours free from the business of holding down a job or eating or sleeping or other routines mean a chance to listen to the radio or read, to go to the movies or go driving. To some, free time means a chance to study, to carry on experiments, or to putter in the garden or the shop. To others, it means a chance to visit or loaf. To some people, time means money. To almost everyone, time is precious.

It was not always so. In past generations the mass of people didn't know enough or care enough about the passing of time to know one hour from the next. Although the clock and the calendar have been of increasing importance in modern times, there are still several million men and women scattered over the face of the earth who are utterly indifferent to them, just as babies are indifferent. That is, their dealings with others are restricted to a small number of persons, to a small area of the earth, to few kinds of relationships. But, as a baby grows up and as society grows up, they acquire new ways to make life interesting and profitable—new uses for time. The seeming indifference of our ancestors to the passing of hours

and of days is closely related to the fact that for most people everywhere there was not until the modern period very much discretion as to the use that they could make of time.

Consider, for example, that in an agricultural community, until within a generation, it took most of the people, including the children, most of the time they had to squeeze a scanty living out of the soil. They were up with the sun and continued to work after sunset so long as they had the candles and the physical endurance, except in winter. Then they were up long before the sun. Rest days meant merely putting off until the next day as much as would stand being put off. And so a holiday meant extra work to make up before and after.

There is an old story about a man trying to sell an incubator to a farmer. He pointed out that with this machine hundreds of eggs could be hatched in the same time that it would take a hen to hatch a mere nestful. The farmer replied to this argument with the now famous remark, "What's time to a hen?"

He was so little aware of his relation to his work and his environment that he didn't realize it was *his own* time that was involved, not the hen's.

This apparent indifference of masses of people to the passing of time was revealed in another way. Until our own times the watch was a rare and precious contrivance. For two or three centuries it was only the nabob of the village who owned one. It was kept in a gold or silver case and exhibited to visiting nabobs. The rest of the population had to take the count of hours from the church bell. Even today, when you can buy a watch along with a slide-rule or a wire-gauge and other tools in the hardware store, many people still keep their time-measuring instruments in cases of precious metal and cannot think of buying one except at a jewelry shop, where they go for other luxuries and extravagancies.

Gradually, however, time came to be important for ordinary folks. More and more of them moved into the cities where the stores and factories required the workers to come in at fixed hours. Gradually, with fixed hours, in contrast to farm work and housekeepers' work which everyone knows "is never done," men and women came to have an appreciation of the odd minutes and hours that they could use in their own way—with neither bossy the cow nor any other boss to hold the watch on them. In so far as people do care about time, as they have more and more of it to play with, they become increasingly interested in its measurement and its conservation. And so gradually it became important to more and more men and women to know ahead when a holiday was due. Printers began to manufacture calendars in vast numbers, so that now every household has several calendars per person per month, in contrast to the old farm almanac which had to serve the whole family an entire year.

The greatest changes in our lives, since the childhood of our oldest

inhabitants, are related to the new technologies which science has made possible. These changes are not always gains, certainly not universal gains. The labor-saving devices themselves, which have long been praised because they can obviously lighten our work, are closely implicated with far-reaching changes that strike millions as "unemployment." Waiving all questions of praise or blame, however, it is obvious that the organization of our work along lines that enable us to make use of the new devices has had two effects upon our appreciations and uses of time.

In the first place, the rigid arrangements of machinery oblige workers increasingly to meet fixed appointments for starting and stopping work. The craftsman in his own shop can proceed at his own pace, as the member of an assembly-line gang cannot. He can also work whatever hours he finds most convenient. To take part in mass production means to submit to the prescribed schedule of hours. And that means a more intimate acquaintance with the passing of time and the units of time than earlier generations usually acquired.

In the second place, however hard one is obliged to work under the domination of the machines, and however poorly one considers himself rewarded, the closing bell or whistle means a definite release from strain. Increasingly it has meant "free" time to do with as one's fancy or opportunity permits—free time in a sense that the pioneers never knew. Whether the definitely available time is used for the movies or athletics, for carousing or for dreaming, there is no doubt that the men and women of today are coming to value the hours which they can themselves control.

But out of these changes comes a further development. To make full use of the highly complex machinery of new technologies, it becomes desirable to operate many kinds of mills continuously. Some will recall that the public was repeatedly scandalized by revelations of conditions in steel mills and other plants that kept their workers on twelve-hour shifts. The management was unable to figure out how continuous operation could be maintained except on that basis.

"It's very simple," they said, "look: Twenty-four hours a day, divided by two, 12 hours. All right, day-shift 12 hours, night-shift 12 hours." Eventually there came some managers who knew the division tables up to three, and they found a way of running continuously on three 8-hour shifts. But it took a further lesson to locate periods away from work as long as 24 or 48 hours. That took more arithmetic, plus study of calendars.

As more industries and transportation and communication systems have to be operated continuously, and as more people become interested in what they can do with their leisure time, it is necessary to consider the calendar. For short-time plans, any calendar will do. When it comes to making plans ahead, especially when those plans are complex, it matters enormously how the calendar is arranged. And, when it comes to con-

sidering an equitable distribution of holidays and rest-days for a large industry, the modern calendar presents difficulties.

It is necessary to consider the rotation of workers in a way that lets each one have his turn at the Sundays, which have to be "covered"; and at the same time lets each one have his share of the holidays, which for so many workers constitute the bright spots in the year. Our present calendar does not permit equitable planning from the worker's point of view. The tradition of one day of rest for every run of seven days fixes the Sabbath regularly enough. But the distribution of other holidays is erratic, so that in the course of a year practically every weekday may be a holiday. With random assignments some individuals will be cheated out of their holidays entirely while others will be exceptionally lucky. To be sure, in the course of six or seven years everything will average out. But while stars and planets go on their way eternally, ordinary people cannot plan their private affairs on such generous cycles.

The problems and complications that confront us almost make one long for the good old days before science became a household word and technology started to color the lives of all of us. Science got us into this mess and one is tempted to turn to the scientists and say, "Now get us out of it."

This might be a good idea, not only for the sake of justice, but from the point of view of common sense. The calendar is, after all, a convenience, an instrument with which we can most easily keep track of time, and we need it for the same reasons that we need standard weights and measures. That is, in proportion as we have dealings with one another, in more and more ways and over larger and larger areas, we have to agree on the units in which we carry on our transactions. Great progress has been made, especially through the increasing use of the metric system, in standardizing various units. These are all more or less arbitrary. While also arbitrary to a degree, the calendar is sharply limited by the habit which the earth seems to have of swinging around the sun at a nearly uniform rate so far as we can judge, and at the same time of spinning on its axis at another fairly uniform rate. The fact that the day-and-night cycles do not match very closely the year-and-season cycle, while the moon has a cycle of its own, makes the astronomer's task a hard one.

The trouble with the calendar is not that the astronomers weren't accurate enough, but that everybody in authority has tried to take a whack at it for personal or partisan reasons. Not only politicians and statesmen, but church officials tried their hand at it too. Somehow people got the idea that, since the calendar was necessary to fix holidays and feast days, there was a mysterious "religious" quality about it. Actually, the days of the year and the months are without spiritual individualities except as we ourselves put meaning into them.

Now a calendar, with its Pagan, Christian, Confucian and Hebrew trimmings and symbols, is primarily a mathematical scheme to help people arrange their affairs more effectively.

The World Calendar proposes workable compromise between incommensurable weeks and months on one hand, and random incidence of holidays in relation to weekly cycle on the other. It includes the advantage of even halves and quarters, as well as a permanent calendar. All important holidays fall into place the same way each year. It plans for greatest benefit to the largest number of people.

As people come to value not only their liberated hours but whole days, week-ends, and longer vacations, the calendar comes to be of direct concern to everybody; and the proposed World Calendar comes to be a great convenience and time-saver, as well as a powerful social lubricant.

THE MAN AND THE MOON

By Charles Francis Potter

I WAS talking with the gardener of a neighboring estate this spring about the importance of sharpening hoes and spades. I told him that the farmers in the Adirondacks where I spend the summer laugh at me because I use a file on my garden tools.

"But then," I said, "they are so dumb up there that they still insist that potatoes won't grow if they are planted in the dark of the moon."

"Oh well," replied he, "what can you expect of them hill-billies? But it's a funny thing about lima beans. You gotta plant 'em when the moon is a risin', 'cause if you plant 'em when she's wanin', they won't climb at all. They'll just drop off the poles. If the moon is waxin', though, they'll just shin up them poles like all git-out."

These interesting present-day survivals of age-old superstitions about the influence of the moon on vegetation recall the large part the moon has played in the calculations of mankind. Scholars and scientists may smile at such superstitions, but in the world of common folk the moon bulks large, and is invested with strange powers.

It would seem that simple folk have felt instinctively, because they live close to nature, that the moon exerts a certain influence on earth. When primitive man measured time by the moon, he was recognizing the importance of a familiar and important phenomenon.

The influence of the moon on the earth is seen most conspicuously in the matter of the tides. There is a gravitational pull of the moon which "bellies out" the water surface of the earth on the side toward the moon in such a way that the apparent encircling of the earth by the moon causes periodical rises in the height of the waters of the ocean at any particular place.

And it has lately been discovered by an amateur seismologist, Mr. Richard Greenspan, that the moon has a similar gravitational pull on the land surfaces of the earth, particularly when the moon is in the same direction from the earth as some other celestial body. Based on this fact, Mr. Greenspan has predicted earthquakes and volcanic disturbances with startling correctness as to time and place. The New York *Times*, in recounting the remarkable accuracy of some of Mr. Greenspan's predictions, says: "Seldom has any person had the satisfaction of having the earth corroborate him three days in succession by unloosing its mighty forces. In the Middle Ages anyone like Mr. Greenspan would have been burned at the stake as one who was in league with the forces of evil."

It is this uncanny element which has impressed common men and women when they think about the moon. They have maintained that there is something sinister about its influence. See it over the left shoulder when

it is new, and it will bring you bad luck. Wish on the new moon, however, and it will bring good luck. If the moon shines on an infant, that child will be lunatic—literally, moonstruck. All these superstitions, and many more, have filled the lore of mankind. In various ancient religions, the moon was worshipped as having a powerful influence on the affairs of men.

No wonder, then, that this recognition of the moon's power should show itself in the method by which man has measured time.

The derivation of the very word for month (moonth), is significant. The Latin word is "mens, mensis," the Greek is "men," the Irish, "mi," and the Sanskrit, "mas." The root of the Latin word is "me," to measure. That is, the moon is the measurer of time.

H. G. Wells in his "Outline of History" declared: "The earliest recorded reckoning is by moons and by generations of men." By the moon, men first measured periods of time. The alternate darkness and light of the sun's passage made a day, to be sure, and was probably first noticed by the dim light of the earliest intelligence of *homo sapiens*. But, in the length of a man's or a tribe's lifetime, a day was too short to be an acceptable measuring rod. A score of a hundred days soon passed, and primitive man could not count easily beyond a hundred. The time that passed between full moons was a better way of reckoning. As a matter of knowledge, we are aware that the early calendars were figured in months. The lunar year was the favorite.

Another bit of evidence pointing to the antiquity of the month as a measurement of time is the fact that the months are named; the days and years generally are merely numbered.

To be sure, four of our own months—September, October, November, and December—are numbered, from the old Roman reckoning of the year as beginning in March. But the first six are named for gods and goddesses, and the seventh and eighth for Roman emperors. In the more primitive civilizations, one finds the names of the months still more revealing.

The Ojibway Indians of North America named January the Cold Moon, February the Snow Moon, March the Worm Moon, April the Moon of Plants, May the Moon of Flowers, June the Hot Moon, July the Buck Moon, August the Sturgeon Moon, September the Corn Moon, October the Traveling Moon, November the Beaver Moon, and December the Hunting Moon. The last days of each moon they called the "naked days," and the first appearance of the next new moon, "coming again."

Here we see reflected the close connection between the moon and the common life and occupation of the people. Their calendar was not a matter of mere mathematical reckoning, but an intimate part of living.

Of course, such calendars varied with the latitude, as is easily seen when we compare that of the Ojibways above with the one used by the Peruvians of the time of the Incas. With them January was the Small-growing Moon, February the Great-growing Moon, and the rest, in natural sequence, the Flower-growing Moon, Twin-ears Moon, Harvest Moon (imagine harvest in May!!), Breaking-soil Moon, Irrigation Moon, Sowing Moon, Moon of the Moon Feast, Moon of the Feast of the Province of Uma, Moon of the Feast of the Province of Ayamarca, and Moon of the Great Feast of the Sun. In Brazil, at the present time, the Bakairi Indians have as a name for January, Hardest Rain; February, Less Rain; and March, Rain Ceases.

From the aesthetic and poetic point of view, I regret that the foreign names of

our months really mean nothing to us today. They have no nature connotations. So I rejoiced as a boy in New England when my mother taught me the old verses: "January brings the snow; makes our feet and fingers glow . . . February brings the rain; breaks the winter's icy chain . . . March brings breezes loud and shrill; stirs the dancing daffodil," and so on through the year. We still speak in the autumn of the Harvest Moon and the Hunters' Moon, but those are applied particularly to the days of the full moon.

When we reckon time by months we have a very real problem. The moon, by which we count our months, and the sun, by which we tell our seasons and years, do not seem to pay much attention to each other in the matter of their relation to the earth. There are more than 12, but not 13 months in a year. If you divide the solar year into 12 parts, each of those parts is slightly larger than a moon month.

This fact was early recognized. Observers, in those far-off times, discovered that the months had a peculiar habit of moving. It has been agreed that our month of May was planting month, for instance, but in the course of a man's lifetime, no matter how carefully the moons were counted, May turned out to be harvest month! Great thinking had to be done, in the course of which arithmetic was born. It was finally solved in a very ingenious manner by putting in occasionally an extra nameless month. This was the beginning of what we call intercalation, without which no calendar is possible.

Captain Jonathan Carver, in a book published in 1796, telling about his travels and observations among the Indians of interior America, remarks: "Some nations among them reckon their years by moons, and make them consist of 12 lunar months, observing, when thirty moons have waned, to add a supernumerary one, which they term the lost moon; and then begin to count as before."

By this primitive and naive method of saying, "We won't count this month," they got the year to come out fairly even, and thus made a pretty satisfactory calendar. But an exact calendar waited upon the time when astronomical science was developed enough to measure the real difference between the lunar year and the solar year. This lost moon month, or month that we don't count, was very naturally taken by early men as a sort of holiday, a gift from the gods. It is the real origin of our winter solstice festivals, including Christmas, New Year, and Twelfth Night.

Twelve lunar months of 29½ days make 354 days. The solar year is 365¼ days. So there are approximately 12 days of intercalation. These 12 days necessary to balance the calendar are found in many different localities to have been eagerly taken as days of feasting and revelry. The ancient Hindus, the later Germans and the Celts all observed the intercalary days as a time of great joy to all people. In Brittany the last six days of December and the first six of January are called *Gourdeziou*, or "supplementary days." In Wales they are called *Dyddiau Dyddon*, "days of days," and are the "blank days" of the Welsh laws. It was somehow felt that, since the days did not count in the calendar, the indulgences generally permitted by the priests did not count against one's moral and religious record. Even today the extravagances of eating and drinking at "Merrie Christmastide" are winked at by the social guardians.

These 12 days of intercalation and good times can be traced back to Indo-European and even Vedic times. There was thought by the common people to be even something magic about them. Twelve days balanced the 12 months, and there grew up the idea that there was in each of the 12 days a sort of prophecy of the coming 12 months.

I read last year in a newspaper of a man in the Middle West who took six onions at Christmas time and cut them into 12 halves. He took the core out of each half, put salt into the little cup thus made and prophesied the amount of rain in each of the twelve coming months by

the amount of moisture in each cup. I smiled, for I had read in Sir James Frazer's book, *The Golden Bough,* of how the same thing had been done by European peasants for many centuries, although the newspaper article hailed the Kansas prophet as doing something original. The ancient Brahmans believed that intercalary days are "an image of the coming year."

Thus has man justified and rationalized his natural inclination to count time by the moon. Months there will be as long as there are calendars.

To the ancient Egyptians credit should be given for having harmonized their calendar in which both the moon and the sun influences were recognized. They computed their year on the seasonal periods which were under the direct influence of the sun and they kept to the 12 months.

The perpetual 12-month equal-quarter year proposed by The World Calendar Association appears to me a sensible solution of the problem of improving the calendar. We would avoid the short 28-day February, for one thing. For another, we would balance the half-year. At present, the first half of the year is actually three days shorter than the second half, thereby making inaccurate all semi-annual comparisons.

Then, again, every year would be the same, as was the early Egyptian calendar and a simple trick of memorizing, easily learned by every child in grammar school, would do away with all calendars. Once it is fixed in memory that the first month of every quarter has 31 days, and all the other months, 30 days, with a Year-End Day at the close of the year, and a Leap-Year Day in mid-year after June 30 every four years, there is nothing else to bother with. Birthdays and holidays would come on the same weekday every year. The calendar for one year lasts a lifetime.

In this modern method, proposed by The World Calendar Association, the great problem of the moon, which has bothered the sons of men on this planet, is once more solved. We still have our familiar 12 months, but they are equalized in our solar year. Everything is taken care of, and all our traditional deference to Lady Moon preserved. We can have all the poetry of it, and live as close to nature as we wish, and at the same time we can have a calendar nicely adapted to every phase of our human life.

PROFESSOR WYLIE'S NEW TEXTBOOK

ALTHOUGH Professor C. C. Wylie's new book, *Our Starland,* was written as a text book for grammar school children, it is far more readable and interesting, even to adults, than the average popular work on astronomy. Its 20 pages on "Time and the Calendar" can be recommended as an excellent foundational treatment of the subject, suitable for anyone who seeks a thorough grounding in the elements of calendar reform. The remainder of the book is such as to compel any reader's attention.

The book is published by Lyons and Carnahan of Chicago, and sells at the low price customary for school text books. It will prove a valuable and inexpensive addition to the library shelf of anyone interested in the backgrounds of calendar reform, a subject in which Prof. Wylie—from his post in the Department of Astronomy at the University of Iowa—has been a pioneer and leader.

CALENDARS AND DEADLINES

By FREDERICK CLAYTON

Formerly associate editor, McCall's Magazine, Liberty, etc.

THE calendar that can help to make an editorial deadline actually a deadline will probably never be devised, though I am perfectly sure there isn't an editor anywhere who doesn't wish it might be.

For that matter, such a calendar would be almost as great a boon to certain authors I have known. I shall never forget the time I heard one internationally famous newspaperwoman beg the editor of a large weekly magazine to let her work according to deadlines—just to name a day upon which her copy *must* be in each week. She was engaged in writing a fiction serial for the magazine at the time; and although there was little doubt that her story would be acceptable even if not turned in until the last moment, and just as little doubt that she would deliver the finished manuscript in time for scheduling, the editor flatly refused to take a chance on deadlines. The writer, of course, had been accustomed to working for newspaper editors, necessarily more exacting in the matter of deadlines than any magazine editor, and she couldn't get used to having thrust solely upon her the responsibility for getting her story done and into the editor's hands on time. In this particular magazine editor, however, she's met a man who made it a rule not to schedule a story until copy was finished.

Most people like to lean, and an author, if he can't lean on an editor, sometimes yearns to lean on a deadline. I suppose it is chiefly that unpredictable, undependable element called human nature which so greatly complicates the life of the editor of a popular magazine. Especially in the case of a weekly magazine, since the greater the publication's frequency, the more frequent the editor's headaches. He never knows whether his authors are going to get their copy in on time; often he is so unfortunate as to have to gamble even on his editorial assistants.

Such a thing as a schedule of deadlines, then, might seem to the outsider a pathetically useless weapon with which to fight toward publication dates; but it is also undeniable that the editor would have a far worse time of it if he didn't at least try to do his work according to some sort of calendar plan, however sketchy and incomplete. For it is by the calendar, of course, that he produces his periodical; with the regularity that the word periodical implies, he hopes, and reasonably close to certain fixed dates. So that what calipers are to a sculptor or the musical measure to a composer or the table of weights and measures to a chemist, a calendar schedule is to an editor. It is his rule of thumb.

It is apparent, then, that a calendar such as The World Calendar, con-

taining a divisible number of months and at the same time having greater uniformity in the days of each month and week than has ever been possible under the constantly shifting Gregorian calendar, would go a long way toward making an editor's life a happier one. For with the publication date of his magazine once fixed, whether on the first or the fifteenth or the twenty-fifth or some other day of the month, schedules of deadlines for advertisers and art departments and printers—and the editor himself—could be devised with much less effort. And they would be permanent schedules, too; as permanent, as perpetual, as The World Calendar itself. In his enthusiasm the fortunate editor might even go so far, I daresay, as to arrange a perpetual set of deadlines for all copy and art work; and instead of having laboriously to figure out in advance the customary lengthy schedules of dates and deadlines for each department, he could simply mark them all upon his perpetual World Calendar and hang it upon the wall of his office. And when he had found that he had a really workable schedule he could leave his marked-up calendar unchanged upon his wall from year to year (assuming, of course, that he was a good enough editor to hold the whip over his authors and the various departments under his jurisdiction and could make them actually work according to deadlines!).

To know that there were always just three months of exactly thirteen weeks, or ninety-one days, in each quarter of the editorial year; that every quarter began on a Sunday and ended on a Saturday; that the four natural seasons of the year (important to the editor of any magazine in which the publication of seasonal material is desirable, and of particular importance to the circulation department, for which seasonal statistics have a special significance) could be made to correspond with equal periods in terms of months; that every month had the same number of working days—all this knowledge, and more of a like nature that would come with The World Calendar, would be advantageous to any magazine editor.

Similarly, what Mr. R. L. Duffus of the New York *Times* calls the "stabilized holidays" of The World Calendar would further simplify the editor's task. Without having to consult his calendar every time, he's always able to put his finger on the most appropriate holiday issue of his periodical. If, late in the summer, he decided he wanted to schedule for the far future a story appropriate to Thanksgiving, and for the following spring an article about Easter customs, he'd know instantly that the two respective issues in which these pieces should appear would be those which would be on sale during or just before the weeks of November 26th of the same year, and of April 2nd of the next year. And he'd know that the proper issues would be the same for every year, and that he wouldn't have to consult the calendars of two *different* years as it is necessary for him to do under the present system.

Even more than the editor, of course, would the printer be helped by

the adoption of The World Calendar and its stabilized holidays. An editor can never properly call his time his own anyway; his week-ends, his evenings, are often as filled with work as his weekdays—especially if that troublesome human element has bobbed up again and the editorial schedule has broken down sufficiently to make a late issue threaten him. The printer, on the other hand, has behind him the superior force of numbers and organizational strength. He has been able to regulate his work, as far as his time is concerned at any rate, so that it is now highly mechanized. If the editor is late with his issue and insists that it get into print anyway, come hell-and-high-water, as far as the printer is concerned it's a simple question of being paid on a well-established overtime basis. For which very reason, the number of working days in every month, as well as the number of working hours in every day, is of the utmost importance to him, and the adoption of so radically improved and simplified a system of time-measuring as The World Calendar could hardly fail to put new system and order into the printing business.

And what a boon to the magazine distributor! With his schedule fixed according to a World Calendar, he scarcely need trouble himself to look ahead in order to make certain that shipping and publication dates will not be upset by, say, the conjunction of a holiday and a week-end.

Most important of all, perhaps, is the help that such a new calendar would give to the advertising department of any magazine publishing house. Important not only because of the fact that advertising, for most large popular publications of today means business and revenue and profits, but important also because in part the advertising rates of a magazine are fixed in accordance with the frequency of the periodical's appearance and advertising contracts are based on issue, monthly, quarterly or yearly contracts. Obviously, it is important to the advertiser to know just how many days the issue or issues in which he has taken space will be on sale, and to know that a similar contract for space in any other similar period would give him the same coverage, or at least the same coverage as a corresponding period in any other year. With such a new calendar in effect he'd know much more accurately just where he stands than he does at present, and a certain amount of guess-work in the accurate estimating of coverage, in the fixing of periods and rates, would be eliminated.

As an editor, I think I can safely say that my tribe would accept it—would welcome it—this new World Calendar. We magazine people have suffered enough, I feel, under the haphazard and irregular nature of the old calendar; and whether or not the new one would help to make deadlines better deadlines, there are certain clumsy and awkward features of the old calendar that, as far as life in an editor's office is concerned, would be improved upon or even eliminated altogether by the universal adoption of The World Calendar. May it be put to work for us!

AS VIEWED FROM CANADA

By the Hon. Martin Burrell

Former Secretary of State of Canada; late Parliamentary Librarian, Ottawa

From the Book Review Section of the Ottawa *Citizen*

SOME thirty-five years ago, when in British Columbia, I first heard of the world movement for calendar reform. The movement has since spread all over the civilized world, and is destined, I feel sure, to be an accomplished fact in the lifetime of many of my readers.

Among those who are vigorously promoting the cause of reform is Miss Elisabeth Achelis of New York, president of a society formed to push the movement along. She recently wrote an excellent little book, entitled "The World Calendar," which contains in detail what has been done in calendar reform since 1930, and sets forth cogently the reasons for such reform. Another book, published last year, bearing on the subject, but much wider in scope, is Mr. P. W. Wilson's "The Romance of the Calendar." This is a fascinating volume, which only towards the latter part deals with the proposed World Calendar, though it is obvious that the author is in sympathy with the proposal.

Mr. Wilson's book is packed full of interesting matter. The story of the calendar is a long one, stretching back to the dim light of early dawn. Yet it is concerned with modern as well as ancient times. For ages man realized the value of what we call time, and looked upon it as something to be measured and valued. Without some kind of reckoning of time in his kitbag he could not take a step in the upward path of progress.

Mr. Wilson, in dealing with The World Calendar, enumerates some of the advantages, and remarks: "In view of these facts, is it too much to say that, within the solar years, The World Calendar yields a maximum of equalization and adjustment of weeks and months with a minimum of disturbance to familiar customs and traditions?" It is a claim that applies no less to historical dates, to scientific calculations and, indeed, to all chronometrical usages. The change from the Gregorian to The World Calendar is much less drastic than the addition of two months by Julius Caesar and the omission of eleven days by Pope Gregory XIII.

In speaking of the advantages of The World Calendar, Mr. Wilson mentions something of special interest to Ottawa. He is referring to the inconveniences experienced in the time tables of the English railways many years ago. The time varied everywhere when you traveled by coach or train. The problem was puzzling. "It was not until 1878 that a Scottish-Canadian, Sanford Fleming, brought forward a plan for dividing the earth by means of 24 meridians, each 15 degrees of longitude apart, and reckoned

from Greenwich. Each zone would represent an hour of difference in clock time." The plan was logical. But there were difficulties before it was generally adopted. In 1880 Great Britain ordained by statute that all of her clocks should keep Greenwich time.

Calendar reform has for many years been studied by a committee of the League of Nations. The plan now overwhelmingly favored by that committee is the one known as The World Calendar. Of 45 countries which have expressed their opinion, only six are opposed. Miss Achelis has pointed out that the main defects in our present calendar lie in its disproportionate arrangement. How many of us know on what day April 15th will fall next year, the year following, or in five years hence? To regulate the year into something like systematic order by which we can tell such things would be of great advantage. It can be arranged simply and easily without upsetting our present system too much.

The World Calendar, says another writer, secures the following results:

A year of twelve months that shall be uniform with each day of every month, including holidays and anniversaries, falling on its appointed day. For instance, New Year's Day would always be a Sunday, the first day of the week, and Christmas would always be a Monday.

Four equal and uniform quarters in the year, each of 91 days, or 13 exact weeks, each beginning on a Sunday and ending on a Saturday, and each containing three months respectively of 31, 30, and 30 days.

An international holiday conveniently called Year-End Day (the 365th day) lying between December 30 and January 1 on an extra Saturday, with an additional holiday in Leap Years (the 366th day) set between June 30 and July 1 on another extra Saturday.

It has been remarked that the movement for a World Calendar has an importance beyond the calendar itself, that many of us are disturbed in our minds over animosities between nations, races, religions. The world needs an international sense—a commonsense—that will lessen these dangerous emotions. The movement in favor of a World Calendar is drawing together leaders in church and state. A calendar that is convenient for all to use makes for reconciliation.

The fixing of Easter—proposed for Sunday, April 8—would be a boon. With Easter coming always on the same day, all other dependent feast-days fall into regular order. It may be remarked that in the Gregorian reform of 1582, Pope Gregory himself favored a fixed Easter. The great Eastern Orthodox Church has officially endorsed a fixed Easter. At the Geneva Labor Conference the delegates of 47 nations unanimously approved of calendar revision. In England Lord Desborough expressed the wish "that this long-needed reform of the calendar and the stabilization of Easter may be introduced in 1939." And the Archbishop of Canterbury observed it would be a misfortune if the matter were allowed to drift.

The date January 1, 1939, is mentioned because the new calendar would then coincide with the present one, which would not occur again until the

year 1950. Personally, I should like to think it possible that The World Calendar could come into effect in 1939. But as it is a matter that could only be settled by agreement among the governments of the civilized world, it may be too optimistic to think the reform can come by that time.

In an article published last year, the well-known historian, Professor James Truslow Adams, sets forth his views on the whole subject in an excellent way. "The past," he says, "is past and we cannot alter that, but if we can get a better calendar for the future we should, in my opinion, most certainly do so. The World Calendar appears to me an enormous improvement over our present one. I am opposed to standardization in many fields, but there are other fields in which a complete standardization vastly simplifies life, and saves waste of time and effort. In any occupation, we live in a network of time, and if anything should be standardized and simplified it should be the measurement of time."

Professor Adams proceeds to demonstrate how in the field of history, and the other fields of commerce, statistics, and so on, the proposed alteration of the calendar would make for a simpler life. One can easily see how confusing the present calendar is for the statistician. That question is ably dealth with by Mr. G. S. Wrong of the Dominion Bureau of Statistics in another magazine article. He gives powerful reasons for supporting a calendar that will permit of more accurate and less laborious work in compiling data of immense value in the world of commerce. This whole subject is not only an interesting study but one of importance to us all, and I pronounce myself a humble supporter of "The World Calendar."

The history of the past is strewn with calendars and reformed calendars. Moses handed on the improved Egyptian calendar of his day. In the Sixth Century B.C. Solon, the lawgiver of Athens, was active along the same line. Julius Caesar reformed the calendar, Omar Khayyam, who had become Astronomer Royal, with the help of seven scientists produced the Malik-Shahi calendar in Persia in 1079. Then, in 1582, Pope Gregory finished his revision of the Julian calendar and the Western World has been using the Gregorian calendar ever since. And now, after the lapse of more than three centuries, the time has come for removing its anomalies.

The development of the calendar has been an age-long struggle for simplification of astronomical fractions. The calendar has depended on four celestial bodies—sun, star, moon and earth itself. The rotation of the earth around the sun gives the year, the position of a star in the heavens suggests a point in time from which to measure the year, the rotation of the moon around the earth gives the month, and the spin of the earth on its axis gives the day.

Solon lived in a period when time was measured by the moon. He accepted that standard but appreciated its grave irregularities. For long centuries sun and moon fought for mastery over the measurement of

time. From the first the Roman year was based on the lunar month. Those condescending ultra-moderns who so blithely wash out the past, as having no interest for their superior minds, forget that the very names of the months during which they spend their more or less valuable time are a heritage from the Romans. Look at their list—Januarius, Februarius, Martius, Aprilis, Maius, Junius, Quintilis, Sextilis, September, October, November, December. Julius Caesar altered Quintilis to his own name, hence our July, and Augustus gave his name to Sextilis.

Julius Caesar, to whom we must concede the name Great, was bent on arranging a calendar in which hours, days, weeks, months, years, should be as simply defined as the units of length, volume, and weight. Surrounded by apathy and confronted by opposition, he achieved his task.

The calendar as he found it was an accumulation of inaccuracies. He corrected that aggregate of error and arranged a calendar that should be immune forever from maltreatment by careless and dishonest guardians. Of all the achievements of Caesar, it is this achievement by which he is generally remembered. For one person who can tell of his victory in Gaul over Vercingetorix, or on the plains of Pharsalia over proud Pompey, there are a thousand who are familiar with his month of July.

For scientific advice he turned to Egypt. First there was a frank and final abandonment of the lunar year. Then the solar year was taken to be 365¼ days. Thirdly, the civil year became what it is today, namely 365 days, and fourthly, each fourth year was allowed an extra day and this took care of the quarter of a day referred to. February 23rd was repeated as "leap day." In the Roman belief odd numbers were lucky and even numbers brought bad luck. Julius Caesar changed Quintilis to July, the month he was born in, which had 31 days. However, when Augustus came along he decided to appropriate Sextilis, and call it Augustus, though he was born in September, and promptly gave it 31 days instead of the former 30.

The true solar year is 365 days, 5 hours, 48 minutes, 46 seconds. So the Julian year was rather more than eleven minutes too long, which means that in a thousand years the error was nearly eight days. So that when Gregory XIII reformed the Julian Calendar he had to set the clock right, and it was decided in 1582 that ten days should be omitted from the calendar. One result was that in England a mob collected and yelled "Give us our eleven days back." As the Pope had brought about the reform of the calendar it was natural, perhaps, that the Roman Catholic countries immediately adopted the new calendar and the Protestant countries were slower coming around. However, Queen Elizabeth's detached mind saw the convenience, though acceptance of the new calendar did not come in England until 1752.

Of all calendars the Chinese is the most ancient. With a few modifications, the present Chinese Calendar dates back to B.C. 2357, two centuries older than Abraham, 15 centuries older than Homer, 18 centuries older than Buddha and Confucius. The Chinese have ever been famous as astronomers, and their observatory in Pekin, built by order of the great conquering potentate, Kubla Khan, A.D. 1279, is still the oldest in the world. In 1911 China officially adopted the Gregorian Calendar, but the ancient one is still used among the common people.

SO WAGS OUR TIME TODAY

From The Nautical Gazette, *America's Oldest Shipping Journal*

"Of time as of space we cannot assert a real existence; it is not in things, but in our mode of perceiving them."

ON NEW YEAR'S DAY, the last page of the old calendar is torn off and a new array of months, weeks and days confronts us. Again, the shifting days must be scrutinized. Arbitrary months before us show that the first half of the year has 181 days while the second half has 184 and the four quarters of the year have 90, 91, 92 and 92 days, respectively. Is such a system methodical? In these days of rapid communication around the globe, is the present calendar in step with civilization?

From time immemorial, man has been puzzled in measuring the passing seasons and in making appropriate divisions. A former member of the British Parliament, P. W. Wilson, has told the complex story in his book, *The Romance of the Calendar.* Astronomers, mathematicians, churchmen and archaeologists have wrestled with the manifold questions that have arisen and have given contributions to reforms. Then, there was a heated and enduring battle between the adherents to the sun and the moon as an authority over the calendar, which ended with the solar year triumphing over the lunar year. From deep in the records of antiquity up to the annals of today, engrossing discussions have persisted.

Now that it is claimed that calendar reform might aid shipping, The Nautical Gazette has inquired from the United States Naval Observatory whether some individual plan is being sponsored. Because he makes such a cogent reply, we quote from the letter sent by the Superintendent, Captain J. F. Hellweg, U.S.N. (Ret.):

"You state that this change is of interest to shipping. It is of more interest to the navigation of ships at sea. As you undoubtedly know, due to the earth's revolution, the sun apparently moves through an angular distance of 360° in 12 months. So at the time of the vernal equinox the right ascension of the mean sun is zero hours and it again returns to zero hours after 12 months. That gives you the rate of 30° a month. Now suppose you divide the calendar year into 13 months, divide 360° by 13 and see what an impossible numerical value you get.

"At the present time, every sailor who navigates knows that this movement is equal to 30° a month, or 4 minutes a day. Now divide that by 13 and see what a heck of an answer you obtain, and then try to visualize what some poor bucko mate on a tramp steamer is going to do, trying to navigate by thumb rule, with such impossible fractions as even the simplest problems will develop. Frankly, I hope the day will never dawn when our fanatics and reformers will succeed in foisting on the people, the unsus-

pecting public, such a colossal mistake as the adoption of the 13-month calendar."

The advocates of "The World Calendar" maintain that its systematic form will not only aid in navigation but also help transportation organizations in arranging sailing schedules and itineraries.

The calendar extant was promulgated by Pope Gregory XIII in 1582 upon the advice of prominent astronomers and was adopted in all Catholic countries. Germany, however, did not accept it until 1700 and Great Britain, together with her colonies including the United States, refused to abide by it until 1752. The sage advisers to Pope Gregory had proven that under the older Julian calendar, the year was computed on a 365.25 basis while in reality there are 365.242 days in the year. The addition of an extra day every fourth year in observance of leap year gradually caused the calendar to slip behind the sun. While the discrepancy was too slight to be noticed in the beginning of the Julian calendar, by 1582 ten days had slipped. The Gregorian calendar, therefore, dropped 10 days, but by the time that Great Britain had espoused the system, 11 days between September 2nd and 14th, 1752, had to be suppressed. To perfect the alignment, Pope Gregory decreed a new leap year rule that three century leap years in each 400 years must be non-leap years. So wags our time today.

Long before the World War, there had been evidence of dissatisfaction with the Gregorian calendar's irregularities. At economic, religious and scientific conferences, the subject had been weighed. In 1919, the International Astronomical Union formed a special commission under Cardinal Mercier to probe revision and at the 1921 meeting of the International Chamber of Commerce projects for a new calendar were agitated. Finally, in 1923 the League of Nations set up a committee under the Section on Communications and Transit on calendar reform which had in its membership the astronomer to the Vatican, a Greek, a French, and a Dutch professor, the secretary of Britain's Royal Astronomical Society and Willis H. Booth, the vice-president of the Guaranty Trust Company of New York. Since that time extensive investigation has been under way and expressions have been elicited from a multitude of sources. In the meticulous routine for such a far-reaching subject, the Council of the League of Nations deliberated on the question of reform at its meeting on September 16, 1937, stating in its findings that "it is superfluous to recapitulate the incontestable advantages from the social and economic point of view presented alike by the simplification of the Gregorian Calendar and the stabilization of movable feasts." Thirty-two countries had expressed their views and only five were definitely opposed to calendar reformation. One of the most encouraging factors to the exponents of simplification was the attitude of the Holy See in not closing the door to reform but, on the contrary, leaving it open. It had been asserted already by many high pre-

lates that nothing in dogma precluded further rectifying of the calendar. The Council of the League found, nevertheless, that "it is not expedient for the time being to contemplate convening a conference to carry out a reform" but it retains the subject on its agenda.

What reforms, what changes and what simplifications have these crusaders in mind? How can the score or more calendars now in usage throughout the world be made to conform? In the United States and in England, there was a thirteen-month calendar proposed which had as its chief "angel," the late camera-tycoon Eastman, but with his demise the plan has lost its momentum. Obviously, the awkward part of that scheme is that thirteen is not divisible by two or four. Computation of interest and rents would be complicated. Reports, statistics, invoices and periodic meetings would be thrown into a confused state. Chaos in business, science and religion would ensue. It is said that the League of Nations has considered almost one thousand proposals of other ingenious schemes.

The dominating plan that has received support from serious students of the question in practically every nation is "The World Calendar." It proposes four identical quarters, each containing exactly three months or thirteen weeks or ninety-one days. Every quarter begins on a Sunday and ends on a Saturday and each month has twenty-six working days. This has been achieved by giving the first month in each quarter thirty-one days and the two other months thirty days apiece, making three hundred and sixty-four days. To make the calendar identical for each year, a zero day is inserted between December thirtieth and January first and for the quadrennial "leap day," an extra day would be inserted between June thirtieth and July first. Both of these days are to be considered holidays. It is this form of simplification of the calendar that has the most formidable backing. Tomes have been written in justifying its adoption and a great mass of testimony from every angle has registered approbation. "The World Calendar" deserves separate and special treatment.

PRESBYTERIAN OPINION

By Victor Herbert Lukens

Pastor Emeritus, Presbyterian Church, South Orange, N. J., in the *Presbyterian Tribune*

DESIRABILITY of adopting a new calendar has been kept prominently before the international public for about a quarter of a century. Many proposed calendars have been examined and voted upon by hundreds of individuals in many nations; by a large number of societies, such as chambers of commerce, conventions of business men and of learned societies; and informally by many governments.

Out of the suggested calendars two stood out prominently, one proposing a 13-month year and one a 12-month year. Gradually the superiority of the 12-month calendar, now called The World Calendar, impressed itself upon students of the subject, so that now it is the only one seriously under consideration by the League of Nations and the Presbyterian Church.

BUSINESS BACKS REFORM

From Business Digest, Chicago, January, 1938

STATISTICIANS and accountants who have to struggle with comparisons of months of varying lengths, stylists who must cope with an Easter that may fall anywhere between March 22 and April 25, churchmen who must step warily along the intricate calibrations of an ecclesiastical calendar superimposed on the secular calendar, have been suggesting for years that something be done about our unsymmetrical calendar. The first voices, heard in the early years of this century, were isolated and faint. They have been gathering strength, however, until the demand has been heard in organizations the world over and has engaged the attention of the League of Nations. In this country, clearing house for the movement is The World Calendar Association with its quarterly *Journal of Calendar Reform*, which chronicles the growth of the movement.

That function has fallen naturally to the Association, and its *Journal*, for the demand for calendar reform has gravitated almost entirely to the particular suggested new calendar advocated by them. The information contained in this article is taken entirely from recent issues of the *Journal*.

There have been various suggestions for a new calendar that would obviate the defects of the Gregorian calendar now in use. One that attained considerable support a score of years ago was designed to divide the year into 13 months of 28 days each. Each month would begin on Sunday and end on Saturday. This would account for a total of 364 days, the odd day to be covered by some dateless day, preferably at the end of the year, to even things up. In leap year, of course, there would have to be two such days. There were a number of suggestions as to the placing and naming of the 13th month, the one most frequently mentioned being the placing of the new month, to be called Sol, between June and July.

The proposal met with many objections. Perhaps as good a statement of them as can be found was made in the *Journal* by P. W. Wilson, formerly a member of the British House of Commons, who discussed the possibilities of getting a reform bill through Parliament, and eliminated the thirteen-month proposal for a number of reasons, including the inherent antipathy of the mass of humanity for the number 13, to say nothing of the fact that there probably would be much protest because the 13-month calendar would include no less than 13 Fridays the 13ths. Other objections are the impossibility of dividing such a year into even halves and quarters, which would leave the accountants and statisticians wholly opposed; the necessity for complete readjustments of wage and rent rates; the difficulty of figuring interest on a monthly basis; the disarrangement of ecclesiastical, social, and business events (including the publication of

monthly magazines) that now take place monthly, and the fact that a whole new month would be added to the calendar and no fewer than twenty-nine dates of sentimental and historical association lost entirely.

Mr. Wilson favors the particular calendar advocated by The World Calendar Association, which has been named The World Calendar. It proposes a continuation of the present year made up of 12 months, dividing it into four equal quarters. Each quarter would consist of 91 days as compared to the present variation of from 90 to 92 days. Each quarter would begin on Sunday and end on Saturday, and the first month of each quarter would have 31 days with the other two having 30 days each. Thus, January, April, July and October would be identical months on the calendar, each beginning on Sunday and containing 31 days. February, May, August and November would also be identical, beginning on Wednesday and having 30 days each. March, June, September and December, each 30 days and beginning Friday, would be identical, each ending Saturday.

In The World Calendar, also, the extra day, in order to make up the yearly quota of 365, would be a dateless day, falling between Saturday, December 31st, and Sunday, January 1st, tentatively called Year-End Day. In leap year a second such day would be inserted between Saturday, June 30th, and Sunday, July 1st.

The World Calendar, as a number of writers in the *Journal* point out, would simplify many accounting and statistical details. Because of the fact that the 31-day months (January, April, July, and October) each has five Sundays, while the other eight months have the usual four, there would be uniformly 26 working days in each month. The proposed year divides itself into two halves of 182 days each, and four quarters of 91 days each. Because the same calendar would be used year after year, figures for the same months in succeeding years would mean something.

Writers in the *Journal* have examined The World Calendar from many angles. R. L. Duffus, staff writer of the *New York Times*, for instance, hopes such a calendar would be supplemented by a simplification of holidays. He calculates that, allowing for Sundays, Saturday half-holidays, and the celebration of holidays falling on Sunday on the succeeding Monday, there are just 27 days in the year when businesses engaged in foreign trade may be certain that offices all over the world will be open. His hope is that the adoption of The World Calendar will include the shifting of holidays uniformly toward Monday.

The World Calendar has been formally endorsed by the Chamber of Commerce of the British Empire and by the National Educational Association, and the American Statistical Association, in the United States, as well as by many trade and scientific associations. The Universal Christian Council for Life and Work endorsed it at a conference at Oxford, the Eastern Orthodox Church has officially approved it, and the Vatican

has expressed interest, pointing out simply that the subject would have to have the attention of an Oecumenical Council. Elisabeth Achelis, president of The World Calendar Association, calls attention to the fact that The World Calendar was conceived by Abbé Mastrofini, an Italian Catholic priest, and that many of its most enthusiastic supporters have been ecclesiasts of that faith.

Strongest support for the new calendar has come from the South American republics. The fact that the matter was submitted to the League of Nations by the representative from Chile has caused it to appear on the agenda there as the Chilean plan. Formal action taken by the League put the matter into the hands of its transit and communications committee to consider whether or not a conference of nations on calendar reform ought to be called. The committee's report said that, of 32 nations questioned, 16 accepted the Chilean plan in principle; five were definitely opposed; six made no comment; seven professed themselves unable to express an authoritative opinion, and four said that calendar reform at the present time appeared premature. On the basis of these replies, the committee reported that the time was "not opportune" for calling a conference of nations on calendar reform, but "An English Observer at Geneva," writing in the *Journal*, professes to see "definite progress for the movement."

"Only those who hoped that the walls of Jericho would fall at the first blast of the trumpet can fail to recognize that the work of the League for the cause of calendar reform this year has served to register a definite step forward," he says.

Apparently the only organized opposition to The World Calendar thus far has come from certain religious bodies which adhere to the belief that the procession of the Sabbath has remained unbroken since the beginning of time. To these, the interposition of days without dates would break that procession. While professing sympathy with these views, several writers in the *Journal* insist that such groups will have to give way as small minorities and that, since all of them now observe the Sabbath, instead of the more usual Sunday, as the day of rest, they are already out of step with the secular calendar and cannot be much affected by anything done to disturb the procession of Sunday which to them is of no greater significance than any other ordinary week-day.

There exists, however, a considerable obstacle to the institution of The World Calendar in less than 12 months. To make it effective with a minimum of disturbance requires its initiation on a January 1st that falls on Sunday under the present calendar. That coincidence will take place at the beginning of 1939, but even the most optimistic supporters do not feel that world-wide acceptance for The World Calendar can be developed in so short a time.

A NEW CALENDAR BY 1939?

By The Reverend Edward S. Schwegler, D.D.

Priest of the Roman Catholic Diocese of Buffalo

(From *The Ecclesiastical Review*, February, 1938)

THE perennial subject of calendar reform continues to pop up right along; and it is to be feared that the great majority even of intelligent and educated people do not quite understand what it is all about. At the present time in particular there is much discussion about the possibility of introducing a revised calendar in 1939. Why 1939?

Because that year begins with a Sunday; and the only plan for reform that has met with anything like universal approbation also begins with a Sunday. If 1939 does not bring us a revised calendar, we shall have to wait until 1950 before we again have a year beginning with Sunday.*

The anxiety to start off on a Sunday is of course due to the fact that no one would wish to drop or lose one or more days by introducing a new calendar, as would happen, for example, if the Gregorian year of introduction began on Thursday. Calendar reform is sufficiently controversial as it is, without any added difficulties.

Mention has just been made of the only plan that has met with anything like universal approval. This is the so-called "World Calendar." It consists of twelve months counting a total of 364 days. Every three months constitute a quarter quite identical with the other quarters, each of which has the same number of days, 91 (31, 30, 30), and the same recurrence of relative dates and weekday names.

With our present calendar, each year begins a day (two days in leap years) later than the previous year. The meddlesome extra day is the one left over after 365 is divided by 7, the number of days in the week. If the year consisted of 364 days instead of 365, the number of days would be exactly divisible by 7, each year would begin with the same day of the week, and a uniform calendar for each year would result.

Modern calendar reform does the unprecedented by sequestering the troublesome day (two days in leap year), making it a holiday, and taking it out of the usual succession of weekdays entirely. In this way only 364 Sundays and weekdays are counted, and uniformity is produced.

From another standpoint, the plan is equivalent to taking a week in the year and ending it with two Saturdays instead of one; or, as some insist, it is introducing one or two 8-day weeks into the year. When The World

*Editor's Note: Should 1939 prove too early for the adoption of the World Calendar, then Dec. 31, 1939, or Dec. 31, 1944, are acceptable dates. As these dates fall on Sunday, they could be considered as the Extra Saturday in The World Calendar and allow the New Year, Jan. 1, 1940, or Jan. 1, 1945, to begin with Sunday.

Calendar first came into prominence, it met with much opposition at the hands of another plan of reform. This was the 13-month scheme, also known as the Eastman plan, from the fact that George Eastman supported it. In this proposal, as in The World Calendar, one or two days are sequestered; for, there being 13 months of 28 days each, or a total of 364, the extra day would otherwise still remain.

The sequestered day has received many names, as "blank day," *dies non*. Calendar reformers prefer "supplementary day." The other terms are misleading. The extra day or days in the reformed calendars are, after all, real days of 24 hours each. They simply have names of their own and are placed outside the ordinary calculations of the weeks.

Nowadays the 13-month plan is rarely mentioned in calendar reform circles and in the periodical press. Yet it is a tribute to the effectiveness of the consistent publicity originally supporting this plan that three out of four persons who are asked about a reformed calendar will at once make some vague reference to 13 months.

The World Calendar as above outlined has received its most powerful and consistent support from The World Calendar Association of New York. The president of this organization is a talented and energetic lady, Miss Elisabeth Achelis. She has succeeded in rallying under the banner of The World Calendar some of the most influential personalities not only of this country but of the whole world. Renowned statesmen, writers, business men, clergymen, lawyers, and a host of others have subscribed to the plan under her leadership.

The World Calendar Association has allied itself with similar groups in the principal countries of the world. Every year since 1931 it has published the *Journal of Calendar Reform*, which is sent out to all members and associates of the organization, and to all large libraries and educational institutions in the country. It is a dignified, learned review, and has helped to place calendar reform on a high intellectual plane.

The list of contributors to the *Journal* reads almost like a publisher's dream. It is profoundly significant to find all the persons of national and international reputation who have thought enough of The World Calendar not merely to approve of it, but to write about it, or some aspect of it, *in extenso*. Just to mention a few names: S. Parkes Cadman, H. Parker Willis, Dom Fernand Cabrol, Rear Admiral F. B. Upham, Mahatma Gandhi, Professor N. C. Abbott, Professor Bristow Adams, Professor C. C. Wylie, George Gordon Battle, Henry W. Bearce, Lord Desborough, D. R. Fotheringham, Ernest McCullogh, Rear Admiral W. A. Moffett, Julian Morgenstern, Erich Przybyllok, Archbishop D. Germanos, Capt. J. F. Hellweg, P. W. Wilson, Robert Hunt Lyman, Dr. I. G. Reyes, Professor Arthur Kennelly, Charles Francis Potter, James Henry Breasted, Abbé Chauve-Bertrand, Bishop Manning and many others.

Besides issuing this constant and dignified publication, The World Calendar Association has gathered together an astounding number of endorsements from all kinds of organizations, and has been the spearhead of international action on the subject.

One outstanding result of these various activities has been to make journals of public opinion 12-month conscious. Editorial and other writers hardly mention the revolutionary 13-month scheme any longer. This is going to result eventually in making calendar reform and The World Calendar synonymous, even in the stubborn and slow-moving popular mind.

Concerning the advantages of a reformed calendar the present writer has already written amply,* and it would make this article too lengthy to recapitulate them. The present writer has also treated very exhaustively the attitude of the Vatican on calendar reform. To review this briefly, the Apostolic Nuncio at Berne, His Excellency Luigi Maglione, Archbishop of Caesarea, stated for the Vatican that, though there were no dogmatic difficulties about the proposal to stabilize the Easter date, an attempt to carry out the proposal would necessitate "the abandonment of deeply rooted traditions," and that the Holy See "would not be prepared to consider the question except on the advice of an ecumenical council." Since that time (1924) the Vatican Secretariat of State has sent out to inquirers a lengthy exposition of its stand, in which a number of historical considerations against changing the present mode of dating Easter are given, and the original statement of Msgr. Maglione is reaffirmed.

Thus, a number of contrary "indications" notwithstanding, it seems certain that the Vatican, down to the present moment, looks with disfavor upon the proposal to reform the calendar. The latest proof of this is to be found in the Official Report of the Proceedings of the League of Nations Council at Geneva, 1937,† where we read: ". . . As is clear from the information conveyed to the Committee by several of its members, the Holy See, after having previously stated that it could not consider any change in the date of the movable feasts, has taken up an even more definite attitude during the present year in that it has approached certain governments, stressing more particularly (1) that the stabilization of movable feasts could not be separated from calendar reform, but such stabilization should be conditioned on the meeting of an ecumenical council; (2) that as regards the reform of the Gregorian calendar, the intro-

*"Some Aspects of a Fixed Calendar," *Ecclesiastical Review*, January, 1935; "Do We Need a New Calendar?" *Columbia*, May, 1932; "Priests and Calendar Reform," *The Sign*, February, 1934; "Calendar Reform and the Liturgy," *Orate Fratres*, 8 September, 1934. These articles are summarized in a brochure, "Catholics and Calendar Reform," which anyone sufficiently interested may have by writing the author and enclosing ten cents in stamps. "The Vatican and a Fixed Easter," *Homiletic and Pastoral Review*, April, 1934; "The Vatican and Calendar Reform," *ibid.*, May, 1934.

†*League of Nations Documents*, C. 380 and 385, 1937. Cf. *Journal of Calendar Reform*, VII, 3, p. 129.

duction of blank days would result in breaking the continuity of the weeks and be incompatible with venerable and long-established traditions."

It would be interesting to have for publication just what the Vatican did say to "certain governments" on these occasions. It is to be doubted, for example, whether the Holy See stated expressly that "the stabilization of movable feasts could not be separated from calendar reform." What it probably did say was that stabilizing Easter, which is a religious holiday, and introducing the supplementary day, which would have an effect on the traditionally sacred institution of the seven-day week, are both matters of a primarily religious nature, and so would have to be settled by religious authority. There is no intrinsic and necessary connection between stabilizing Easter and stabilizing the calendar. Easter could be placed on a definite Sunday, and so "stabilized," without introducing The World Calendar at all; and on the other hand, Easter could be placed, as at present, on the Sunday following the full moon after the vernal equinox, even if the permanent World Calendar were adopted.

One must draw the conclusion from all this that the Vatican in the past year has "campaigned" against any change in the calendar. But it also seems definitely clear that the Vatican finds no dogmatic difficulty either in the stabilizing of the Easter date or in the use of the supplementary day to stabilize the whole calendar. The latter point is extremely significant. Up to now there has been a great deal of diffidence about accepting the "blank day" idea on religious grounds.

The stand of the Holy See on the whole question of calendar reform to date is very understandable. The calendar is deeply rooted in the most venerable of traditions, and the Vatican naturally feels that no changes should be made in it unless there is an insistent and well-nigh universal demand for such changes. It also evidently feels that, the matter of Easter having been settled by an ecumenical council, any change in this element of the calendar should be settled through similar channels. Therefore the task before those interested in calendar reform, if they wish ever to gain the approval of the Holy See, is to arouse a steadily increasing volume of public opinion, whilst at the same time treating all religious angles and issues of the movement with the utmost carefulness and sympathy.

In this latter detail The World Calendar Association has been eminently successful. It has not only eliminated all anti-religious bias from its activities, but it has done much to break down the old idea that calendar reform has an essentially anti-religious motive. It has enlisted many clergymen in its ranks, and it has been particularly anxious to gain the sympathy and support of priests. Accordingly, it has published in complete or condensed form a number of articles and books written by priests in favor of reform. One of its most successful moves along these lines

was to enlist the active support of the renowned Benedictine Abbot Fernand Cabrol, recently deceased.

The occasion of the above mentioned communications by the Vatican to different governments was a draft convention for calendar reform submitted to the League of Nations Council by the representative of Chile, and sent to all the members of the League. The convention outlined The World Calendar and said nothing of the 13-month plan: a further indication that the former is now supreme in the field. There were 24 states which did not answer the communication from the League; 45 governments responded with the following results:

14 accept the proposal, at least in principle;
6 are definitely opposed;
9 offer no remarks;
9 cannot define their attitude at present;
7 think the reform premature.

The League Council concluded that "it is not expedient for the time being to contemplate convening a conference to carry out a reform which in present circumstances would seem to have no chance of being accepted, and that, under such conditions, it is unnecessary, until further notice, to retain the question on the agenda."

It would seem in place, therefore, to draw the following conclusions:

1. There will not be a revision of the calendar by 1939.

2. In the last few years the atmosphere has been permanently cleared, with the result that "calendar reform" now means only one thing: The World Calendar with twelve months, four equal quarters, and one or two supplementary days.

3. Neither the proposal to stabilize Easter nor the use of the supplementary day to stabilize the calendar meets with any dogmatic difficulties.

4. Easter can be placed on a more permanent date without changing the calendar, and the calendar can be made permanent without eliminating the present method of calculating Easter.

5. The League of Nations does not consider the matter closed, but is merely setting it aside "until further notice."

6. The Holy See would be open to conviction if there were a sufficiently insistent demand for calendar reform.

7. It is permissible for Catholics to discuss the matter pro and con, provided always they insist on the necessary religious implication of the subject and upon the sole competence of the Holy See to pass the final decision.

8. Those interested in calendar reform must produce a much more effective and universal public opinion, before they can get definite results.

And so, apparently for some time to come, we shall have to continue the time-honored practice of rattling off: "Thirty days hath September, April, June and November . . ."

TIME THROUGH THE AGES

By Arthur M. Harding

Professor of Mathematics, University of Arkansas

This is the sixth of a series of articles on the scientific backgrounds of man's system of measuring time. The writer is a distinguished member of the American Mathematical Society, the American Astronomical Society and the American Association for the Advancement of Science. He is the author of the most popular textbook on astronomy which has been published in many years.

EARLY peoples used different calendars, but these were all regulated by making use of one or more of the natural units of time—the year, the month, and the day. For recording the time of day the Babylonians invented the "hour," with which we are all familiar, but very few primitive peoples had any use for such a short time-unit. However, with the progress of civilization one nation after another adopted this man-made unit for measuring short intervals of time. In every case the Babylonian scheme of dividing the day into 24 hours was adopted, not because an hour of this length was better suited to the needs of man, but because the number 24 could be subdivided into two, three, four, six, eight or twelve equal parts. Imagine having to adjust our lives to a clock that registered 23 hours in every day! It would be even worse than living by a 13-month calendar.

We can tell the time of day very accurately by a glance at the clock, but such things as watches and clocks were unknown to our nomadic ancestors. To them such time-units as minutes and seconds were both unknown and unnecessary. Their only way of determining approximately the time of day was by the position of the sun in the daytime and by the position of the stars at night. Instead of asking, "What time is it?," the early Greeks would say, "What star is passing?"

The earliest known device for determining the time of day is the sundial, a very crude and inaccurate instrument. A celebrated sundial of about 700 B.C. is mentioned in Isaiah (38:8). The sundial divided the day from sunrise to sunset into 12 equal parts, but these "hours" were of different lengths in different seasons. When mechanical clocks were introduced in the 15th century, time could then be measured in *equal* hours, and the sundial, being no longer of any value, soon disappeared. These instruments are sometimes used as ornaments today, but they are of no practical value.

A sundial is composed of two parts—a *dial face*, which is divided into quarters with the dividing lines running toward the four points of the compass, and the *gnomon*, a flat piece of metal set in the center of the dial

and pointing toward the North Celestial Pole. Of course the sundials in southern latitudes must have their gnomons pointing toward the South Celestial Pole. After a sundial had once been properly constructed it would give very good service as long as it remained in the same latitude. But if it were moved toward the north or toward the south, the angle of elevation of the gnomon would have to be changed, because the elevation of the North Celestial Pole is always the same as the latitude of the observer.

The accurate measurement of time by means of clocks does not seem to have been attempted until about 140 B.C., and it was not until about 800 A.D. that these "clocks" came into general use. Among these early devices for keeping track of the hours may be mentioned water clocks, sand clocks and candles. Alfred the Great was able to tell the time of day very accurately by means of candles which were so constructed that they would burn approximately four hours.

The pendulum clock, upon which so many of us depend for our time today, was invented by the celebrated Italian astronomer, Galileo, about 1600. One day as Galileo was sitting in the Cathedral of Pisa his curiosity was aroused by a chandelier that was hanging from the ceiling. Being more interested in science than in religion, he studied the vibrations of this chandelier and discovered that the time of each vibration was the same, whether the arc through which the chandelier oscillated was a long one or a short one. The pendulum clock is today in universal use but very few of us know where it originated. This method of keeping time was given to the world by the young Galileo, who sat in the Cathedral timing the vibrations of the chandelier by holding his finger on his pulse, when he should have been devoting his attention to the services.

If your clock should stop and you should find it necessary to telephone an acquaintance to inquire as to the time of day, you should specify what kind of time you want, because modern people actually make use of five different kinds of time. We have Sidereal Time, Apparent Solar Time, Mean Solar Time, Standard Time and "Daylight-Saving" Time. In order to measure time, some kind of a unit is necessary. The most satisfactory unit is the day, but, since we use different kinds of days for measuring different kinds of time, it is obvious that our "days" are not all alike.

Sidereal Time, or "star time," is furnished by the stars and regulated by them. This is the kind of time used in our astronomical observatories where the sidereal clocks keep step accurately with the daily procession of the stars across the meridian. The sidereal day is defined as the length of time required for the earth to rotate on its axis with reference to the stars. Since the length of this rotation period seems to be absolutely constant, all sidereal days are of the same length. If the star Sirius is crossing the meridian at any instant it will be back on the meridian after the passage of one sidereal day. The same is true of any other star.

The time we actually use in our everyday life is derived from Sidereal Time, but before we can keep any accurate record of "star time" we must first answer the question, "When does the sidereal day begin?" Obviously, we might pick out any star, or any point in the sky for that matter, and begin the sidereal day when this star, or point, is on the meridian. One of the most important points in the sky is the Vernal Equinox—where the sun crosses the equator from south to north about March 21st. The rotation of the earth carries this point across the sky at a uniform rate and, by common agreement, the sidereal day begins when the Vernal Equinox crosses the meridian, and it ends when this same point gets back to the meridian again.

All sidereal clocks are so regulated as to show zero hours, minutes and seconds at the instant the Vernal Equinox is on the meridian, so that the Sidereal Time at any instant is the hour angle of the Vernal Equinox. In other words, if the Vernal Equinox

passed the meridian 10 hours ago it is now 10 o'clock by the sidereal clock; and if we learn from a star catalogue that Arcturus is 14 hours east of the Vernal Equinox we may expect this star to cross the meridian at 14 o'clock. Sidereal clocks are so constructed as to show a single series of 24 hours a day rather than two series of 12 hours each, and when the Vernal Equinox gets back to the meridian, it is always 24 o'clock.

Many astronomical observations would be of very little value if the astronomer had no means of determining the exact "star time" at any instant. He makes use of very accurate and expensive clocks which are usually kept in a room of constant temperature. He checks his clock frequently and keeps it absolutely correct, an error of as much as half a second being unpardonable.

The determination of the error of a sidereal clock is a very simple matter. A record is made of the clock time of the transit of any star across the meridian and the star catalogue is then consulted to determine when that particular star should have crossed the meridian. The difference in time is the "clock error." The astronomers in our observatories keep the sidereal clocks running accurately by making daily observations on the stars and then convert this Sidereal Time into the kind of time we actually use in everyday life.

Long before the invention of mechanical clocks, man was able to get his Sidereal Time from the stars with a fair degree of accuracy, for nature has placed in the sky two master clocks—one in the northern sky for those who live in the Northern Hemisphere and one in the southern sky for our neighbors south of the equator. These clocks keep perfect time, never run down, and require no attention. After one has learned to read its dial he may obtain the correct Sidereal Time on any clear evening by merely glancing at the northern, or southern, "sky-clock."

Everyone can identify the Big Dipper in the northern sky as it slowly revolves around the North Celestial Pole—the imaginary point where the axis of the earth (produced) pierces the sky. Let us watch the Big Dipper move around the pole some evening. Suppose it is below the pole in its natural position at sunset. Six hours later it will be standing on the end of its handle on the east side of the pole. At the end of 12 hours it will be upside down and over the pole, and at the end of 18 hours it will be found west of the pole and standing on its bowl.

This group of stars has, of course, been behaving in this way from the very beginning. The Greek name for the Big Dipper was the Big Bear, and Homer referred to this group of stars when he said that "the Bear never bathes in the ocean." In other words, it never goes below the horizon.

The two stars in the end of the bowl of the Big Dipper are known as the Pointers, because they always "point" toward the North Star. Although the North Star is not exactly at the North Celestial Pole, we may, for all practical purposes, consider it the center of the dial of our master clock.

Modern clocks have hour hands, minute hands and second hands, but, since the layman can read the time from the stars only approximately, we have no use for a second hand or even a minute hand on our sky-clock. Nature's master clock has only one hand, the hour hand. This can be very easily identified.

First find the group of stars known as Cassiopeia's Chair, on the opposite side of the North Star from the Big Dipper and at about the same distance. Look for an M or W in the sky, depending upon whether this star-group is above the North Star or below it. Now draw an imaginary line from the North Star to the end star in Cassiopeia's Chair and you have the hour hand of Nature's master clock.

And now let us see how to read the Sidereal Time from the dial of this gigantic clock. This may seem a little difficult at first, because the hour hand on Nature's clock moves in just the opposite direction to the one to which we are accustomed. Just as the dials of our artificial sidereal clocks show the hours numbered consecutively from one to 24, so also does the dial of the sky clock, but the numbers must be supplied by our imagination. A little practice will enable you to read star-time with ease.

The inhabitants of the Southern Hemisphere have a similar clock around the South Celestial Pole although its hour hand is not quite so plainly marked. It has one advantage, however, in that it revolves in the same direction as our artificial clocks.

Instead of the Big Dipper and Cassiopeia's Chair, this clock has on its dial the beautiful Southern Cross which is always in an erect position, lying due north and south, when it crosses the meridian. This star-group is a timepiece if you know how to read it.

In the early history of the human race, and even down through medieval times, people were satisfied to live by the sun because the accurate measurement of time was not then necessary. They built sundials to read the time of day from the sun, and noon always occurred when the sun was on the meridian. They used what we now call Apparent Solar Time—satisfactory once, but inaccurate for modern civilization.

An apparent solar day is the length of time between two successive passages of the sun across the meridian. Since the sun moves eastward among the stars, an apparent solar day is not of the same length as a sidereal day. If the sun and the Vernal Equinox are both on the meridian at the same time today, they will not be on the meridian together tomorrow, for the sun will have moved about one degree eastward among the stars so that when the Vernal Equinox gets back on the meridian the sun will lack about one degree of having made a complete circuit around the earth. Consequently, although the sidereal day has ended, the apparent solar day will not end until the rotation of the earth brings the sun to the meridian. This will require about 4 minutes, so that, on the average, an apparent solar day is about 4 minutes longer than a sidereal day.

Sometimes the eastward motion of the sun is more rapid than at other times so that the actual interval from noon to noon, as reckoned in minutes and seconds "sun-time," is of very little importance. On account of the irregularity of the motion of the sun it would be almost impossible to build a clock that would keep time with that heavenly body.

Although the length of the apparent solar day (from noon to noon by the sun) varies throughout the year, the actual variation is very small. December 22d, which is the longest solar day in the year, is only about 51 seconds longer than September 17th, which is the shortest day in the year. In order that we may avoid being misunderstood we should perhaps emphasize the fact that we are here using the word "day" to denote the interval from noon to noon and not in contrast with the word "night."

It would be very difficult to conduct the business affairs of the 20th century in a satisfactory manner and at the same time make use of a timepiece that does not run at a uniform rate. Consequently we do not attempt to get our time from the sun. In order to get around the difficulty of living by a sun that does not cross the meridian at regular intervals, we use a clock that is so regulated that it keeps time with a fictitious sun that is supposed to make the circuit among the stars in the course of a year and move at a uniform rate. In other words, we assume that there is another sun in the sky which crosses our meridian 365 times every year and moves at a uniform rate. This fictitious sun is sometimes ahead of the true sun, and sometimes behind it. All days that are determined by this fictitious sun are of the same length and clocks can be so regulated as to keep time with this imaginary heavenly body. This kind of time is called Mean Solar Time or Average Solar Time.

All mean solar days are of equal length and the same may be said of sidereal days, although a sidereal day is about 4 minutes shorter than a mean solar day. If the Vernal Equinox is on the meridian at noon today it will reach the meridian tomorrow at 4 minutes before noon by the solar clock, the next day at 8 minutes before noon, etc. Thus the sidereal clock will gain about 4 minutes a day, or 2 hours a month, on the mean solar clock and there will be more sidereal days than solar days in a year. The clocks will agree only when the sun is at the Vernal Equinox.

Thus it may be truly said that, although we live by the sun, we actually get our time from the stars. We cannot regulate our mean solar clocks by the ficticious sun in the sky, because it is not there. But we can compute the difference between the mean solar clock and the sidereal clock at any instant, and if the astronomers will see to it that our star-clocks are correct we can keep our sun-clocks running accurately.

If a star rises at 8 o'clock tonight by a sidereal clock it will rise at 8 o'clock every night as long as we use sidereal time, but if it appears above the horizon at 8 o'clock tonight by a solar clock it will rise 4 minutes earlier every evening. In other words,

two months from now it will rise at 6 o'clock. Thus constellations not only rise and set but they gradually drift westward with the seasons. Those now on the eastern horizon at sunset will be near the meridian at sunset three months from now.

When is the sun on time? What a foolish question! How could the sun ever fail to be on time? Are not all earthly affairs regulated by the rising and setting of the sun and are not our seasons due to the motion of the sun from north to south and back again during the course of a year? True enough. We live by the sun but we do not allow it to regulate our time.

Our solar clocks keep time with a fictitious sun because the true sun, for reasons of its own, refuses to move eastward among the stars at a uniform rate. Consequently the true sun is usually either ahead of or behind the clock. This difference between clock time and sun time is known as the Equation of Time. Only four times during the entire year is the sun on the meridian when the clock indicates noon, and we then say that the Equation of Time is zero.

Since modern people live entirely by the clock, most of us are unaware of any disagreement between the time of day as announced by the sun and as shown by the clock. But a little observation will establish the fact that only on very rare occasions do these two time-keepers agree.

We once heard of a farmer who was urged by an energetic salesman to buy a modern clock so that he could tell the correct time at night and on cloudy days when the sun was not shining. Having spent most of his life out of doors and in close communion with nature he naturally got his time from the sun and was suspicious of any patented device that was intended to relieve the sun of one of its most important duties. However, he was finally persuaded to purchase this "new-fangled machine" with a written guarantee that it would keep perfect time.

His new clock attracted much attention and he decided to test it out before making the last payment. In front of his house—facing south—he suspended a plumb line made of heavy cord and one day, at the instant when he and his neighbors agreed that the sun was on the meridian, he carefully traced with the burnt end of a stick the shadow of the plumb line along the wall. Every few days—agreed upon in advance—his doubting neighbors from miles around gathered at the plumb line to test the clock and, to their extreme satisfaction, soon discovered that the shadow was not on the mark when the clock announced noon. After continuing this test for several weeks and finding the clock more "in error" each day, the farmer harnessed his team and drove 25 miles to town to return the clock and demand his money back because this "store-bought" time-keeper would not perform the impossible.

On the 15th of June the sun is "on time," but it daily falls behind until the end of July when clock-noon finds the sun about 6 minutes east of the meridian, and the afternoons—from noon by the clock to sunset—are 12 minutes longer than the forenoons—from sunrise to noon by the clock. The sun now begins to speed up and steadily runs ahead of the clock until about the 10th of November when at clock-noon the sun is 16 minutes past meridian and afternoons are 32 minutes shorter than forenoons.

After the middle of November the sun begins to slow up and steadily loses time, and, since we are living by the clock and not by the sun, we notice that the afternoons begin to lengthen several weeks before the Winter Solstice. Although the sun is then daily setting later by the clock it is also rising later and the interval between sunrise and sunset continues to decrease until the day the sun reaches the Winter Solstice, usually on the 22d of December.

On the 24th of December the sun is again in agreement with the clock, but it continues to fall back until about the 15th of February, when it is 14 minutes east of the meridian at noon and the afternoons are 28 minutes longer than the forenoons. The sun then begins to catch up with the clock and by the 15th of April is again on time. It then runs ahead of the clock until about the 16th of May, when it is 3 minutes west of the meridian at noon, and the afternoons are 6 minutes shorter than the forenoons. After mid-May the sun steadily slows up until it is again on time on June 15.

The 22d of December (sometimes the 23d) is the shortest day in the year, but the sun does not rise latest or set earliest on that day. The earliest sunset occurs

about December 10th, and after that date the sun sets later by the clock every day. When the sun reaches the Winter Solstice on December 22d it does not then begin to rise earlier each morning. It continues to rise later by the clock until Jan. 2.

Although noon is supposed to come in the middle of the day, our forenoons and afternoons are very seldom of equal length, even when we are using Standard Time. For example, on November 12th the sun rises in Chicago at 6:38 a.m. and sets at 4:31 p.m., and the forenoon from sunrise to noon (Standard Time) is 51 minutes longer than the afternoon from noon to sunset.

The inconvenience of living by a sun that is very rarely on the meridian at noon is insignificant in comparison with that of living by a sidereal clock. Let us compute the sidereal time at 6 p.m. on July 4th. At noon on March 21st the sidereal and solar clocks are together. Then at noon on June 21st, 3 months later, the sidereal time will be 6 hours. During the next 13 days the gain will be about 52 minutes, so that the sidereal time at noon on July 4th will be about 6 hours and 52 minutes; in the next 6 hours the gain will be about one minute. Then the sidereal time at 6 p.m. on July 4th will be about 12 hours and 53 minutes, so that if our neighbor, who is living by a solar clock, should invite us to eat 6 o'clock dinner with him on the Fourth of July we must leave home almost an hour after midnight by our clock.

We actually live by Standard Time and not by Mean Solar Time. In view of the fact that the earth is round, the true solar time at any two places on the earth that are not on the same meridian will be different. A clock that is keeping correct Mean Solar Time in St. Louis will not agree with a clock that is keeping Mean Solar Time in Kansas City because, as the earth rotates from west to east, St. Louis will come under the sun before Kansas City does.

Since the sun is at such a great distance its light rays strike the surface of the earth in parallel lines, and, if the earth were flat as was once supposed, they would make the same angle with the plumb line all over the earth at any instant and time would be the same everywhere. But nature has arranged things otherwise by furnishing us with a spherical earth, and the plumb lines are not parallel. A glance at the figure reveals the fact that when the sun is four hours past the meridian in New York City, it is three hours past in Chicago, two hours in Denver, and only one hour in San Francisco. This difference in local time is brought very vividly to our attention by the time announcements broadcast from our modern radio stations.

With the development of railroads it became evident that trains could not be operated with safety unless all of the clocks along the line were made to agree. This was done, and as people began to travel from one part of the country to another, much confusion arose between railroad time and local time. In order to avoid this confusion it was proposed that the surface of the earth be divided into 24 time-belts and that all of the people in the same time-belt use the same mean solar time. In other words, that all of the solar clocks in any time-belt be made to agree at all times.

The proposal to adopt a system of time-belts met with a storm of protest from those who were opposed to any kind of a time agreement that would interfere with "God's time." However, after about four years of discussion, the American Railway Association and other interested groups managed to have the Prime Meridian Conference held in Washington in 1882. This resulted in such a strong sentiment in favor of the establishment of time-belts that the railroads of the United States and Canada adopted Standard Time and put it into effect at noon on November 18, 1883. On March 19, 1918, Congress made Standard Time legal time throughout the U. S.

The United States is divided into four time-belts, and all of the clocks in any time-belt are so regulated as to keep the Mean Solar Time of the meridian which passes approximately through the center of the belt. This is very convenient for business purposes but these clocks are not keeping time with the true sun nor even with the fictitious sun. Only those clocks that are located on the meridian that furnishes the time for that particular time-belt are keeping correct Mean Solar Time. Thus in the central time-belt all clocks east of meridian 90 are slow, and those west are fast.

The fact that the earth is a sphere not only made necessary the adoption of Standard Time, but is also responsible for another difficulty which could only be

settled by international agreement. Let us suppose that we can fly westward in an airplane at such a speed that we will always remain directly under the sun. If we leave St. Louis at noon on Monday the sun will remain constantly on our meridian and it will be noon all the way around the earth. But when we get back to St. Louis we will find that it is Tuesday—not Monday—noon. When and where did Monday noon change to Tuesday noon?

In order to answer this question, the International Date-Line has been established in the Pacific Ocean far from any inhabited countries and coinciding approximately with the 180th meridian. Here a new day is born every 24 hours and speeds westward around the world at the rate of about 1000 miles an hour at the equator. If a westbound ship crosses this line on Sunday morning it immediately becomes Monday morning and one day is dropped from its reckoning. On the other hand, if the ship is sailing eastward the calendar is set back 24 hours and the last day repeated.

Our ancestors got their time from the sun and the stars, and were perfectly satisfied with it. Communication with the people only a few miles away was a very difficult matter so that there was no confusion with reference to the time of day. However, under our modern civilization clocks must be absolutely accurate and they must run together. Since stars can be observed much more accurately than the sun, the time that we actually use is obtained from the stars and then converted into Mean Solar Time. This insures the accuracy of our clocks, and the arbitrary adoption of standard time-belts all over the world makes it possible for us to know the exact time at any instant as shown by the clocks used by any civilized nation on the surface of the globe.

In 1916 the "daylight-saving" plan, which advances the time one hour ahead of the Standard during the summer months, was put into effect in Germany and was soon adopted by Austria, Denmark, England, Holland and Norway. In 1918 Daylight-Saving Time was adopted in the United States for one year, but Congress repealed this law in 1919. However, New York City and many other eastern cities continued to use it. Its popularity spread rapidly over the country and the clocks are set forward one hour during the summer months in many states including New York, New Jersey, Pennsylvania, Maryland, Massachusetts, Rhode Island, Delaware, West Virginia, Illinois, and Indiana. Daylight-Saving Time is also used in Montreal, Quebec, Ottawa, Toronto and many other cities of Canada.

The fact that Daylight-Saving Time remains in use in many cities year after year is sufficient evidence of its popularity, especially in the industrial centers. However, this popularity is by no means universal for Wisconsin has a law forbidding the use of Daylight-Saving Time, and in New Hampshire there is a state law against any community adopting any kind of time except Standard Time. Many cities and towns of Connecticut use Daylight-Saving Time in spite of a state law making it an offense to show other than Eastern Standard Time on clocks publicly displayed.

Daylight-Saving Time is very satisfactory except for people in the western extremity of one of our time-belts. In a city so located the true local time is always 30 minutes behind Standard Time, since the time used in any belt is always the same as that on a meridian that lies near the center of the belt. Thus the clocks in this city are already 30 minutes fast and the sun does not reach the meridian until 30 minutes past noon. If these clocks are advanced one hour the sun will not reach the meridian until one and a half hours after noon and the interval of time from noon by the clock until sunset will be three hours longer than from sunrise to noon by the clock.

RECENT CALENDAR RESEARCH

Radio and World Language

By DAVE HENNEN MORRIS

Member of American Advisory Committee of The World Calendar Association

EDITOR'S NOTE.—In response to many requests, the Journal of Calendar Reform is happy to reprint a radio address delivered by the American Ambassador to Belgium on October 12, 1935. The speaker's arguments for a world language might be applied with equal force to the movement for a world calendar, another undertaking which seeks to foster better understanding. The Ambassador's address was delivered on the same day which marked in Geneva the opening of the first international conference on calendar reform. In The World Calendar, Columbus Day will always fall on Thursday.

AS Ambassador of the United States of America to Belgium, I am happy to send greetings on this anniversary, Columbus Day. At this moment all nations can hear my voice—yes! but will it be understood?

Here I am in lovely Brussels, using the most wonderful instrument ever invented to make possible the bringing of all men into immediate mental relationship with each other. But in harnessing electric waves to do my bidding, I am using a form of speech dating back through the centuries. What a contrast! Before me is a marvelous instrument of communications, new in every detail and thoroughly thought out. Through it I transmit a language, old and not consciously constructed. Like all national languages, it is a product of emotions and a storehouse of local traditions. It is beautiful indeed to those who understand its inconsistencies and love its associations. But it is not a scientific product designed advisedly to overcome the barriers of speech which still separate and fetter men of different mother tongues when they seek direct interchange of ideas. The radio overcomes space and transcends national boundaries, but language barriers restrict its highest possible usefulness. The radio is essentially international, so it needs and deserves an international language, one simple in structure, precise, easy to learn, and free from hidden prejudices and misunderstandings in the meanings of its words. Such a language cannot spring from one national source. It cannot be the language of one nation for use by all nations. It must be a new product, a scientific invention with universal appeal, a linguistic instrument for all mankind.

To achieve the desired result, cooperative effort is required. There must be the scientist to direct, the schoolmaster to teach, and multitudes to advocate and use this proposed constructed language for which the basis already exists.

Let there be a new, unselfish coordination of effort by all, so that each may contribute of his best to a common solution of this world problem. We need a language worthy to supplement the radio and to bring to it new efficiency, so that man's thoughts may be universally apprehended even as this instrument sends the words spoken by their voices to the world.

Today we celebrate the discovery of America. This is an anniversary day. Let us also make it an inauguration day, a day on which is born a determination so to voice the demand for a constructed world-language that the governments of all nations will heed and take action, a determination that there shall be taught in the schools of each country not only the beloved mother tongue to express, as it alone can, the soul of its people—a thousand ethnic languages, if you will—but also at the same time a simply constructed secondary language, one world-language for all, providing the means for direct communication among all mankind.

What greater honor could be paid to Columbus than thus to dedicate this day?

Action of Teachers

By MARGARET M. ROCK

Chairman of Sub-Committee on Calendar Reform of Committee on Resolutions of National Education Association whose report was approved at the July, 1937, Convention; Reprinted from May, 1938, Journal of National Education Association.

THIS movement in favor of calendar reform arises out of the conviction

that what is essential to man ought to be the best that the mind of man can conceive. This movement has been growing for years, and the question is now whether the National Education Association shall appear among many public bodies, including the League of Nations, which have calendar reform under sympathetic consideration. Our broad recommendation is that the Association would be well advised to express such an approach.

The question to be considered is simple. What is the best way of dividing a year of 365 or 366 days into smaller periods—that is, months and weeks?

There are two proposals for rearrangement of the months, the 13-Month Calendar and The World Calendar. The 13-Month Calendar provides for 13 months each of exactly four weeks. But after investigation at Geneva and elsewhere, this calendar, although considered with sympathy in certain quarters, has been held impracticable for general adoption. By a process of elimination, we thus arrive at the opinion that The World Calendar is the only reform on which it is useful for us to pass judgment. Advantages of The World Calendar:

1. It abolishes the wandering week and provides for a perpetual almanac.
2. It retains and equalizes the half years now unequal.
3. It retains and equalizes the quarters, now unequal. Within each quarter, the various time-units—the 91 days, the 13 weeks, the three months—synchronize.
4. It regularizes the months and reduces their inequalities to a minimum.

Educationally, by adoption of The World Calendar, we would be relieved of the necessity of giving instruction in the different lengths of months which have no significance for most children in our schools. The calendar would be brought within the framework of orderly arithmetic. A perpetual calendar would enable us to work out our educational almanac, not only for the year in question but for all years. Many arrangements would be as perpetual as the calendar itself.

The task of arranging the required number of teaching days within the school year would be standardized and simplified. Holidays might sometimes intrude themselves into the middle of the week but they could not wander all over the week. A 10-day Christmas and New Year's holiday could include two week-ends and no split week.

The Council of the League of Nations has a treaty in draft which provides for the introduction of The World Calendar. This treaty has been submitted to governments of member and nonmember States of the League in view of these circumstances, we recommend adoption of the following resolution:

WHEREAS, In the opinion of this Association a simplification of the calendar would be of great advantage to education and educational institutions; and

WHEREAS, The League of Nations has submitted a draft treaty for the international adoption of the 12-month equal-quarter plan known as The World Calendar; be it therefore

Resolved, That the National Education Association hereby endorses the 12-month equal-quarter plan for the simplication of the calendar; and that copies of this resolution shall be forwarded to the President and the Secretary of State of the United States, to the President of the World Federation of Education Associations, and to the Director General of the League of Nations.

Looking Forward

By FRANK PARKER STOCKBRIDGE

Chief Editor American Press Association

WHILE most of us can carry in our heads the old "Thirty days hath September," very few of us can remember on what day of the week Christmas fell last year or the Fourth of July will fall this year, without referring to the calendar.

Considering the calendar, and its complicated arrangement of months so that comparisons of one month with another in business calculations hardly ever give a true picture, I am fully converted to some plan of calendar reform and am looking forward to the general adoption of a new calendar. And that is not so unlikely as it may seem.

One of the first committees set up by the League of Nations was its committee on calendar reform. It has been working quietly with national governments and religious bodies for more than 18 years, and has made material progress, backed up by calendar reform organizations in various countries. Of the two plans originally proposed for a new calendar, the one which seems to be most generally favored is The World Calendar.

EDITORIAL PARAGRAPHS

Almost everyone recognizes the shortcomings and inconveniences of the present calendar, and favors change. In recent years sentiment has tended to crystallize about the so-called World Calendar. This may accelerate greatly the world-wide adoption of a new scheme of counting the days.—Cincinnati *Enquirer.*

The reformed 12-month calendar is very suitable for statistical purposes, making the 13-month calendar superfluous; and it is obvious how advantageous it would be if the present double efforts could be avoided. It is to be hoped that the necessary steps will be taken in Geneva for its realization without further delay.—Zurich (Switzerland) *Neue Zuercher Zeitung.*

A moderate calendar reform is proposed and practically everyone who cares to have a say in the matter appears to be satisfied. —Lansing (Mich.) *State Journal.*

While the subject has not been generally exploited a large number of national governments and labor organizations have given tentative approval toward the new plan and we may suddenly realize that an effort has been started to cure what Shakespeare complained of—time being out of joint.—Danville (Va.) *Bee.*

It is well known that the present calendar is not very satisfactory in its application to economic, social and religious fields. Extended studies have revealed a desire to bring about revision. Calendar reform is a job for experts, and the experts have spoken. The people, it is believed, will approve any reasonable improvement of the present system.—Dayton (Ohio) *Herald.*

In this country we have changed from a March to a January date for our presidential inauguration without any disturbance of business and without distress to anyone save the weatherman. Perhaps we may be fortunate enough to have the new calendar adopted and thus have the chances of a mid-winter temperature Easter thrust upon us.—Jersey City *Journal.*

The proposed calendar would have the merit of having the same number of secular days in each month. The month with five Sundays would have the extra day, making 26 days in each month for business, holidays out. This would make bookkeeping and comparisons easy.—Centerville (Iowa) *Iowegian Citizen.*

We find American teachers joining in the movement for simplification of our present method of measuring time under the Gregorian calendar.—Newport (R. I.) *News.*

P. W. Wilson in "The Romance of the Calendar," presents a subject of great interest. Simply told and admirably condensed, while giving all the essential facts, the book covers the entire development and significance of the calendar to people of every race from remotest antiquity to the present.—Pasadena (Cal.) *Star-News.*

Calendar reform has been suggested for many years, many proposals have been made, but now that the women have become interested there seems to be a probability that something definite may be done. —Hamilton (Ohio) *Journal-News.*

There is much that appeals to reason in the idea of a uniform year of 12 months with each day of each month, including holidays and anniversaries, falling upon an appointed week-day.—Battle Creek (Mich.) *Enquirer News.*

We will hope that conditions may be favorable for bringing The World Calendar into use before 1950.—Orillia (Ont.) *Packet and Times.*

Calendar reform is a matter to which all serious-minded people should give considerable thought.—Asheville (N. C.) *Citizen-Times.*

There is much to be said in favor of calendar reform. And not the least argument is the stabilizing of the holidays. The pleasant experience we are now enjoying with week-end observances should furnish ample evidence of the advantages.—Grand Rapids (Mich.) *Press.*

The proposed reform for the Gregorian calendar is inspired and actuated above all by practical arguments, in contrast to the Gregorian reform of 1582 which had as its goal something essentially religious and scientific.—Rome (Italy) *Sapere.*

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BOTH verbally and in writing the following question is frequently asked: "Isn't calendar reform essentially a social movement?" The questioner usually seeks to differentiate between movements which are social, civil and religious.

Calendar reform is important in all fields of human endeavor; it has aspects social, civil and religious. Yet in answer to the question, "Isn't it essentially a social movement?," the reply might well be a resounding affirmative, particularly if the word *social* is taken in its broadest dictionary meaning: "Pertaining to, or concerned with, the mutual relations of mankind as living in an organized, interdependent body or society." Calendar reform is thus emphatically a social movement, with definite bearings on family life, education, business, economics, science, and the trades and professions.

On the civil side, its implications cover governmental, national and international relationships of broad import. For time, as known in the calendar, is a force that influences the whole world, that belongs to all mankind, that affects all of man's activities.

Dr. Breasted, famous Egyptologist, in writing of the Egyptian calendar makers, said: "The Egyptians were recognizing for the first time a world of social needs which they placed first. . . . The calendar was thus the beginning of a great movement in human life which carried over the thought of man from the world of nature to the world of human life."

The social significance of calendar reform, then, is an overpowering reason for the interest taken in it by governments and by national and international organizations. All reforms of the calendar, from the Julian to the Gregorian, have been social and civil as well as scientific and religious. The same partnership carries into the present effort to bring to enactment the new perpetual World Calendar.

It is the duty and privilege of citizens and leaders to work zealously for this reform, on the basis of the common good. Committees of study and research on its practical application and benefit have been set up in many countries, and more of them are being organized from time to time. Most of them are now pointing to either December 31, 1939, or December 31, 1944, as the most logical date for adoption.

Religion also desires calendar reform. Among Christian churches, advocacy of a fixed Easter has been widespread for more than a generation. Among other faiths, the advantages of a stabilized calendar in the fixation of their various feast-days are also generally recognized.

EXCERPTS AND REVIEWS

Why Not Adopt It?

By George Grafton-Green

Manchester (England) *News*

NEW YEAR'S DAY happened to be a Saturday this year. It might be any day of the week in the hotch-potch system which we use to measure time. Now if we had adopted the rational calendar—a dream of Utopia in an irrational world—New Year's would be Sunday.

It is an ingenious scheme. Every quarter would be the same. Thousands of pounds would be saved in accountancy and costs to commercial firms because Easter would be fixed and not crop up disconcertingly in a different quarter from year to year, and life would be simpler altogether. The reason for the Bank Holiday on what is now December 31 is to get rid of that 365th day which makes equal quarters impossible. It would have no date, but would be known probably just as New Year's Eve.

At one time there was a suggestion that it should be called "Peace Day"—but that was in the optimistic years soon after the war. I rather like an idea which was not unfortunately incorporated in the Rational Calendar that the odd day should be Christmas Day without a date, so that the calendar would then run—Sunday, December 24; Christmas Day, Monday, December 25, and so on until December 30, which would always be a Saturday. That would at any rate always ensure those of us who are not entirely our own masters of a good Christmas week-end every year.

I have not heard one really convincing argument against the reformed calendar. Why then do we not adopt it? Because first it would need international agreement, which is something harder to get even than an *entente cordiale* between Mr. De Valera and Lord Craigavon—and secondly nobody cares enough to do something about it.

By nobody I mean, of course, governments. There are plenty of people and organizations in this country and others, notably the International Chambers of Commerce, who have been working away for years. Easily the outstanding figure in calendar reform in this country is Lord Desborough, that picturesque old sportsman who has one of the shrewdest business brains of any man I know. Much water has flowed over Niagara since he swam it. And there has been much fruitless discussion since he began to work for a new calendar. But he remembers that it took a war to get Summer Time adopted, and he works on.

You would think it would not take so very long to realize the disadvantages of the present system and the benefits of reform. Yet a committee of the League of Nations has taken 15 years to consider the question and recently reported that it did not think an international conference was advisable in the immediate future.

Most nations agree in principle that reform is a grand idea—one of those, in fact, which can be taken out of the pigeon-hole every decade, carefully dusted, and then put back again!

One man who has no illusions on that point, although he still has an optimism which I envy, is Mr. J. B. Perry Robinson, who for five years, almost since its inception, was secretary of the Rational Calendar Association. He took up the post four years after coming down from Oxford. But, alas, the Rational Calendar will not have Mr. Perry Robinson's support in an official capacity any longer. He has joined a publishing house. And in the publishing world they can, fortunately, get on with the job without waiting for international agreement.

Europe Marches On

By William Bird

Paris Correspondent, New York *Sun*

CHAMPIONS of calendar reform are continuing their laudable drive to get their scheme adopted.

About a year ago the League of Nations, after studying various different proposals, agreed on one that seemed to combine the maximum of advantages with the minimum of inconvenience. It was felt that any scheme which involved, like the

Eastman plan, the division of the year into 13 months instead of 12, would be unacceptable to many nations, principally because the year would no longer divide evenly into quarters.

The scheme tentatively adopted, which is backed by The World Calendar Association, founded in 1930, preserves the familiar 12 months but alters the number of days many of them contain. Each quarter would have 91 days, or exactly 13 weeks, and the 12 months together would have 364 days. The 365th day would be added at the end of the year.

The proposal is that January 1 should always be a Sunday, and thus that every quarter should begin with a Sunday and end with a Saturday. The interpolated "year day" would not be any day of the week at all. The day before it would be a Saturday and the day after a Sunday.

Included in the scheme is fixing Easter on a definite date and thus avoiding the present wide variations in the date of Easter. This change would, it is felt, be a boon to business as well as to schools.

The Vatican has let it be known that it has no objection in principle to a fixed date for Easter, and there have been intimations from Rome that if the nations of the world can agree on a reformed calendar the church will ratify it.

Many Chambers of Commerce throughout the world have declared in favor of the scheme, as well as numerous scientific societies. Approval of the principle has also been given by numerous governments, including Greece, China, Turkey and Norway and six Latin-American countries.

Calendar Variations

By Dr. B. F. Yanney
Professor of Mathematics, Wooster College

DURING the first 28 years of the present century, all the 14 varieties or patterns of the Gregorian Calendar were employed. Each of the seven common year patterns of the calendar served three times, while each of the seven leap-year types were used but once. We are now one-third through the second 28-year cycle, in which the order of occurrence of calendar variations is precisely the same as that of the first cycle.

The year 1938 is the first of this second cycle to begin on Saturday. Our civil calendar is therefore unlike that of any year thus far in the cycle. But it is an exact copy of the one used in 1910, 1921 and 1927. Like all the other 13 models of yearly calendar, this one has 11 variations of monthly calendar, the only months having the same arrangement of dates and week days being January and October.

The 365 days of the year are grouped into 42 full weeks and 21 fragments of weeks, so as to fit them into the monthly pattern. Besides the week that had to be divided between 1937 and 1938, giving six days to the former and one day to the latter year, 10 other weeks have to be broken up into two parts each to make connections between the months. The only exception to this is between April and May, an unbroken sequence of eight full weeks.

Another aspect of the maladjustment of weeks and months in our style of calendar may be gained by considering any specified day of the month, say the first. Note how it zigzags through the days of the week, hitting three week days once each, three others twice each and the remaining one three times.

Of course there are a few exceptions to this as a rule. A marked exception in one case should be mentioned. Obviously the 31st, since it is found in only seven of the months, is unique. As a matter of fact, there is one day of the week missed each year. For the year 1938, that day to be missed is Friday. To compensate for this omission, the 31st of January and of October both fall on Monday.

These and many other inequalities and discrepancies have challenged many people, scattered all over the world, to devise a calendar at once simple of understanding and best adapted to the needs of many everywhere. Many plans have been submitted to the League of Nations, which seems the logical organization through which to get action on calendar reform. Of all the plans submitted, only two have survived for serious consideration. Some nations have made commitments in favor of The World Calendar.

And more and more nations are saying, without commitments, that if a change is to be made it should be made in favor of The World Calendar.

FROM THE MAIL BAG

When the proposal came before our General Convention I was glad to advocate it most warmly. It has everything to commend it, and I do not know of any reasonable objection which can be advanced against it. It is bound to win. May the victory come soon!—The Rt. Rev. Ernest M. Stires, Bishop of Long Island.

Your patient and intelligent championship has furthered in a most remarkable manner our approach to a sane solution of the calendar problem.—Rev. Dr. William Kane, S.J., Librarian, Loyola University, Chicago.

I hope that the new World Calendar is successful in binding nations together.—Dr. Rudolf Herzog, Munich.

Good work, keep it up!—P. L. Jackson, Publisher, *Portland Oregon Journal.*

We believe that it would make for greater regularity in the operation of our business year.—Robert Williams, Pres., Ohio Northern University.

I prefer the 12-month equal-quarter plan, as the economical conception of "month" is much more general than that of "week" in Latin-America, where rent, salaries, almost everything, is estimated, collected or paid, taking the monthly basis; and further because commerce and industry may be strongly hit in their cost. —Oscar F. Arrus, Lima, Peru.

I see many advantages in the proposed calendar reform advocated by The World Calendar Association and should be glad to lend my support to the project.—A. J. Moon, Dean, Jewell College, Liberty, Mo.

Your plan is the best I have seen.—G. F. Hubbartt, Columbia City, Ind.

I should like to see your World Calendar universally adopted. I am for it.—Dr. Harry H. Laughlin, Carnegie Institution, Washington, D. C.

The World Calendar—perfectly planned. Traditions retained. I cannot conceive any business, religious or scientific reasons for not pulling for it.—G. Longaker, Madison, Wis.

The idea of the adoption of this calendar appears to me as very excellent, and I do not hesitate to declare myself an adherent, and at the same time try to obtain for it the greatest numbers of adoptions possible.—Jorge Beoufve, Director, General Insurance Company, Barcelona.

I have for some time been deeply interested in this project of calendar reform and sincerely wish the movement could make more rapid progress. I am certain the end is to be attained some day and know that when it comes we shall all be surprised that there should have been any opposition to it.—R. K. Hickok, Pres., Western College, Oxford, O.

Years ago I was strongly in favor of the 13-month calendar but would be very glad to see the 12-month reform put into effect and hope I may live to see it accomplished.—J. G. Lamson, Chairman of Board, Lamson Brothers Co., Toledo, O.

I want you to know that I am very much in favor of the calendar changes suggested. They would greatly simplify college schedules. I hope very much that these reforms will become effective at an early date.—L. H. Hubbard, Pres., Texas State College for Women, Denton, Texas.

It seems to me that The World Calendar meets the needs of the situation better than any other.—S. L. Gulick, Ashland, Ore.

Hindu and Moslem communities should find no difficulty to adopt this new calendar, nor will they oppose it, as the Christian calendar which they are using here for civil purposes has absolutely no connection with their religious fasts or festivals. —V. S. Bendrey, Raghavashram, India.

Personally I plan to present part of the information which you have given to our Student Assembly this semester.—M. Earle Collins, Pres., Tarkio College, Mo.

I am confident The World Calendar, when adopted generally, will be appreciated for its many worthy and practical benefits.—The Very Rev. T. Albert Moore, Moderator, United Church of Canada.

I am very favorable to and interested in The World Calendar.—H. F. Martin, Pres., Midland College, Fremont, Neb.

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COMPARISON OF DATES

Table shows 1939 or 1950 A. D.

NOTE: December 31, 1939, or December 31, 1944, falling on a Sunday, can be reckoned as the extra Saturday with the following day a Sunday, January 1st, to begin the new year under The World Calendar.

Week-days	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter	
	Gregorian Calendar	World Calendar	Gregorian Calendar	World Calendar	Gregorian Calendar	World Calendar	Gregorian Calendar	World Calendar
Sunday	Jan. 1	Jan. 1	Apr. 2	Apr. 1	July 2	July 1	Oct. 1	Oct 1
Monday	2	2	3	2	3	2	2	2
Tuesday	3	3	4	3	4	3	3	3
Wednesday	4	4	5	4	5	4	4	4
Thursday	5	5	6	5	6	5	5	5
Friday	6	6	7	6	7	6	6	6
Saturday	7	7	8	7	8	7	7	7
Sunday	8	8	9	8	9	8	8	8
Monday	9	9	10	9	10	9	9	9
Tuesday	10	10	11	10	11	10	10	10
Wednesday	11	11	12	11	12	11	11	11
Thursday	12	12	13	12	13	12	12	12
Friday	13	13	14	13	14	13	13	13
Saturday	14	14	15	14	15	14	14	14
Sunday	15	15	16	15	16	15	15	15
Monday	16	16	17	16	17	16	16	16
Tuesday	17	17	18	17	18	17	17	17
Wednesday	18	18	19	18	19	18	18	18
Thursday	19	19	20	19	20	19	19	19
Friday	20	20	21	20	21	20	20	20
Saturday	21	21	22	21	22	21	21	21
Sunday	22	22	23	22	23	22	22	22
Monday	23	23	24	23	24	23	23	23
Tuesday	24	24	25	24	25	24	24	24
Wednesday	25	25	26	25	26	25	25	25
Thursday	26	26	27	26	27	26	26	26
Friday	27	27	28	27	28	27	27	27
Saturday	28	28	29	28	29	28	28	28
Sunday	29	29	30	29	30	29	29	29
Monday	30	30	May 1	30	31	30	30	30
Tuesday	31	31	2	31	Aug 1	31	31	31
Wednesday	Feb. 1	Feb 1	3	May 1	2	Aug 1	Nov 1	Nov 1
Thursday	2	2	4	2	3	2	2	2
Friday	3	3	5	3	4	3	3	3
Saturday	4	4	6	4	5	4	4	4
Sunday	5	5	7	5	6	5	5	5
Monday	6	6	8	6	7	6	6	6
Tuesday	7	7	9	7	8	7	7	7
Wednesday	8	8	10	8	9	8	8	8
Thursday	9	9	11	9	10	9	9	9
Friday	10	10	12	10	11	10	10	10
Saturday	11	11	13	11	12	11	11	11
Sunday	12	12	14	12	13	12	12	12
Monday	13	13	15	13	14	13	13	13
Tuesday	14	14	16	14	15	14	14	14
Wednesday	15	15	17	15	16	15	15	15
Thursday	16	16	18	16	17	16	16	16
Friday	17	17	19	17	18	17	17	17
Saturday	18	18	20	18	19	18	18	18
Sunday	19	19	21	19	20	19	19	19
Monday	20	20	22	20	21	20	20	20
Tuesday	21	21	23	21	22	21	21	21
Wednesday	22	22	24	22	23	22	22	22
Thursday	23	23	25	23	24	23	23	23
Friday	24	24	26	24	25	24	24	24
Saturday	25	25	27	25	26	25	25	25
Sunday	26	26	28	26	27	26	26	26
Monday	27	27	29	27	28	27	27	27
Tuesday	28	28	30	28	29	28	28	28
Wednesday	29	29	July 1	29	30	29	29	29
Thursday	30	30		30	31	30	30	30
Friday	31	31		**L			31	*Y
Saturday	Apr. 1	30						
Saturday, extra								

* YEAR-END DAY, December Y or 31, follows December 30th every year

** LEAP-YEAR DAY, June L or 31, follows June 30th in leap years

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JOURNAL OF CALENDAR REFORM

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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter							Second Quarter							Third Quarter							Fourth Quarter						
JANUARY							APRIL							JULY							OCTOBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
8	9	10	11	12	13	14	8	9	10	11	12	13	14	8	9	10	11	12	13	14	8	9	10	11	12	13	14
15	16	17	18	19	20	21	15	16	17	18	19	20	21	15	16	17	18	19	20	21	15	16	17	18	19	20	21
22	23	24	25	26	27	28	22	23	24	25	26	27	28	22	23	24	25	26	27	28	22	23	24	25	26	27	28
29	30	31	..	..	..	..	29	30	31	..	..	..	.	29	30	31	..	..	..	..	29	30	31	..	..	..	..
FEBRUARY							MAY							AUGUST							NOVEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
..	..	..	1	2	3	4	.	..	..	1	2	3	4	..	..	..	1	2	3	4	..	..	..	1	2	3	4
5	6	7	8	9	10	11	5	6	7	8	9	10	11	5	6	7	8	9	10	11	5	6	7	8	9	10	11
12	13	14	15	16	17	18	12	13	14	15	16	17	18	12	13	14	15	16	17	18	12	13	14	15	16	17	18
19	20	21	22	23	24	25	19	20	21	22	23	24	25	19	20	21	22	23	24	25	19	20	21	22	23	24	25
26	27	28	29	30	..	.	26	27	28	29	30	..	..	26	27	28	29	30	..	.	26	27	28	29	30	..	..
MARCH							JUNE							SEPTEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
..	..	..	..	..	1	2	..	..	..	..	..	1	2	..	..	..	..	..	1	2	..	..	..	..	..	1	2
3	4	5	6	7	8	9	3	4	5	6	7	8	9	3	4	5	6	7	8	9	3	4	5	6	7	8	9
10	11	12	13	14	15	16	10	11	12	13	14	15	16	10	11	12	13	14	15	16	10	11	12	13	14	15	16
17	18	19	20	21	22	23	17	18	19	20	21	22	23	17	18	19	20	21	22	23	17	18	19	20	21	22	23
24	25	26	27	28	29	30	24	25	26	27	28	29	30	24	25	26	27	28	29	30	24	25	26	27	28	29	30
													**														*

* YEAR-END DAY, December Y or 31, an extra Saturday, follows December 30th every year.
** LEAP-YEAR DAY, June L or 31, another extra Saturday, follows June 30th in leap years.

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a *"perpetual"* calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Each month has 26 weekdays.

In order to make the calendar perpetual, at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap year, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y or 31 and June L or 31, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays when approved by their respective authorities. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made with a minimum of disturbance.

"Our stability is but balance."—Robert Bridges.

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STUPOR OF MEASUREMENT

By David Eugene Smith

Editor of numerous text books and author of many authoritative works on the history of mathematics, Dr. Smith is at present a professor emeritus at Teachers College, Columbia University, and curator of that section of the University Library which is concerned with the history of mathematics.

OF ALL the animals found on our planet the human being often seems in some respects the most stupid. The dog may lead a man when they are lost in a forest, but generally the man cannot reciprocate. The homing pigeon can go a thousand miles without asking questions whereas the human animal cannot even tell the direction to be taken. Most of the lower animals can build homes for their families, providing them with food, and showing knowledge of the time to build or to migrate, whereas man must hire labor to do all such undertakings in his behalf. On the other hand the beast cannot count aloud, cannot tell how much it will cost to build his house, how many tons of earth must be removed, and the number of workmen that must be employed in its effort.

The beast is stupid, from our standpoint, but the world of humans is stupid enough to feel that it needs more than four hundred different measures in order to "get along." Even in our own country we have dozens of measures when only a smaller number would meet our needs. We have three kinds of tons—long, short, and metric—in our commercial life although we need only one. If we are in England we may weigh 11 stone, but in America the weight would be 154 lb., because one stone equals 14

lb. unless we are a fish, in which case one stone is 8 lb., or cheese, in which case it is 16 lb. (according to the Oxford Dictionary). If we live in New York and wish a gallon of port we may expect 231 cu. in. in the measurement, but in London we should insist upon 277¼ cu. in. In the manufacturing world the confusion is even more confounded since each industry has measures of its own. If we are interested in the measures of ancient times we may observe that more than 20 different lengths of the cubit were used in the commercial regions bordering on the Mediterranean Sea.

To the reader this wandering in the fields of human stupidity and the variants of weights and measures in divers countries and eras may seem to have little concern with the reform of the calendar. On the contrary, however, it has much to do with the problem before us. For example, the metric system, which so enormously simplified the units of measure throughout the world, achieved its success by proving that it can be taught in five minutes and that its comparative values with respect to the common every-day measures are easily seen. All the world of science is today using the metric system and it is quite certain that it almost universally favors The World Calendar or will if it is forcefully brought to the attention of our people.

As to making of The World Calendar better known it may naturally occur to the readers of this Journal that one of the most effective lines of propaganda of the metric system was the one so skilfully followed in the first of our modern World's Fairs, particularly in those held in London and Paris. We are to have two such expositions in New York and San Francisco next year and therefore have a great opportunity presented to us to profit by the past. The Measure of Time, with the measures often of little value as given in so many schoolbooks and used in the marts of trade throughout the world, is rapidly becoming obsolete. The rudiments of the metric system, for example, can be explained and taught to any child of five in five minutes, and the use of The World Calendar can be as easily taught in about the same length of time.

By way of comparing two specimens of stupidity it is interesting to consider a problem used by one of the best known astronomers and time measurers of five centuries ago. The problem was to divide 45 5/6 by 1 5/12, and (using our present symbols) this was the solution:

$45° \; 50' \div 1° \; 25' = 33° \; 45^{I} \; 52^{II} \; 56^{III} \; 28^{IV} \; 14^{V} \; 7^{VI} \; 3^{VII} \; 31^{VIII} \; 45^{IX} \; 52^{X} \ldots$

Although we need, in our inherited calendar, no computations so entangled as this, we approached them before our tables of compound interest involving fractional rates, bases, discounts and time were printed, and we still meet with difficulties that are unnecessarily annoying to say the least. Since we are compelled, as sane persons, to insist upon a reform in the future, and since The World Calendar has met with general approval in both the laboratories of science and much of the world of commerce,

it seems that the time has come for its adoption. It is encouraging to know that in its recent convention the National Education Association, after a year of careful study by a special committee, passed a resolution strongly recommending its use. This, however, is but one of many recent endorsements, for the American Philosophical Society, the Mathematical Association of America, the American Association of Engineers, the American Academy of Arts and Sciences, the Institute of Radio Engineers, and the American Association for the Advancement of Science have all passed resolutions favoring The World Calendar. The fact that 27 international organizations are at work in other lands, promoting this improvement, reveals so many steps in advance and brings encouragement to the American movement in the same direction.

It should also be observed that, although this movement relates primarily to civil life, it has welcome encouragement from those organizations which have, in times past, been leaders in the reform of the ecclesiastical calendar, and again in our generation have joined in the reform movement.

If now the two great World Expositions Exhibitions to be opened in this country in the near future should emphasize the value of the publicity of The World Calendar, and if the United States Chamber of Commerce and the American Bar Association should come to the same conclusion, there would seem to be no serious opposition to presenting it to our Government within a reasonable period. The problem is not that we must change a "good enough" customary practice for something which is difficult to comprehend. On the contrary, we need only a few minutes to see that we exchange a difficult one for another of far greater simplicity.

WHY NOT NOW?

Lansing (Mich.) *State Journal*

CALENDAR reform needs no more preaching. Why do not those in responsible places go ahead and enact the calendar that is proposed? When the 13-month plan was suggested a few years ago, this paper joined many others in protesting against what seemed to us an extreme arrangement, rigid and unfeeling. But The World Calendar is another matter. It merely takes the last few kinks out of a calendar arrangement that for the most part has served us well.

The Gregorian calendar which is used by all civilized countries is a wonderful instrument. It was developed out of the ages of confusion by Pope Gregory XIII. It marked a wonderful advance. Now another revision is needed.

The Gregorian calendar was many generations in getting acceptance, but in these days of easy world-wide communication we may hope that the calendar adjustments yet to be made will be accepted readily and quickly throughout the world.

In so important a matter as calendar reform, it is likely that some of the bodies necessary to general assent will move slowly. But for several years now there has been a very substantial agreement that the League of Nations proposal for a 12-month equal-quarter calendar is the right plan.

The question now remains, since the pig of common assent is caught, why not put it in the bag of accomplished fact?

"30 DAYS HATH SEPTEMBER"

By WADE POSTON, JR.

THERE exists, perhaps, no more vigorous denunciation of the Gregorian calendar than the mnemonic devices which have grown up with it and which are necessary in remembering the lengths of the various months. They constitute a spontaneous manifestation of disorder, which is not the effort of scholars or mathematicians, but of ordinary citizens trying to contend with an inadequate calendar system.

Almost all English-speaking peoples are familiar with the following rhyme—if not in this version, in one of its many others. The lines given here are very common in the New England States:

Thirty days hath September,
April, June, and November;
All the rest have thirty-one,
Excepting February alone,
Which hath but twenty-eight, in fine,
Till leap year gives it twenty-nine

In much of the rest of the United States, especially in the southern parts, the poem concludes: "Which hath but twenty-four and four, till leap year gives it one day more."

The origin of the verse is lost in antiquity. It is at least as old as the Gregorian calendar, and probably much older. The year 1572 marks its first appearance in English literature, when Richard Grafton included it in his *Little Treatise*, an almanac of the period, under the title, "A Rule to Knowe How Many Days Euery Moneth in the Yere Hath." Grafton's version, containing no reference to leap year, ran as follows:

Thirty dayes hath Nouember,
Aprill, Iune & September.
February hath xxviij alone,
And all the rest haue xxxi.

Only two copies of the original work still survive, one in the Henry E. Huntington library, the other in the British Museum. The reproduction which accompanies this article was taken from the latter copy.

William Harrison, in his *Description of Britain*, prefixed to Holinshed's *Chronicle* of 1577, also gives Grafton's version of the rhyme and states that it is a translation of the following Latin hexameters:

Junius, Aprilis, Septemq, Nouemq; tricenos,
Vnum plus reliqui, Februs tenet octo vicenos,
At si bissextus fuerit superadditur vnus.

The last line ("But if it is double-sixed, one is added") refers to the Latin bissextile year of *366* days, which came every fourth year, and was

equivalent to the present leap year. Another English jingle on a similar subject, now most frequently heard in high school Latin classes, may also have had a classic predecessor:

In March, July, October, May,
The Ides are on the fifteenth day,
The Nones the seventh; all other months besides
Have two days less for Nones and Ides.

In English, no mention was made of leap year until 1606, when in the *Return from Parnassus*, we find:

Thirty days hath September,
April, June, and November;
February eight-and-twenty all alone,
And all the rest have thirty-one:
Unless that leap-year doth combine,
And give to February twenty-nine.

It was in this version, also, that "September" first appeared in the initial line and "November" was rhymed with it in the second, as is now

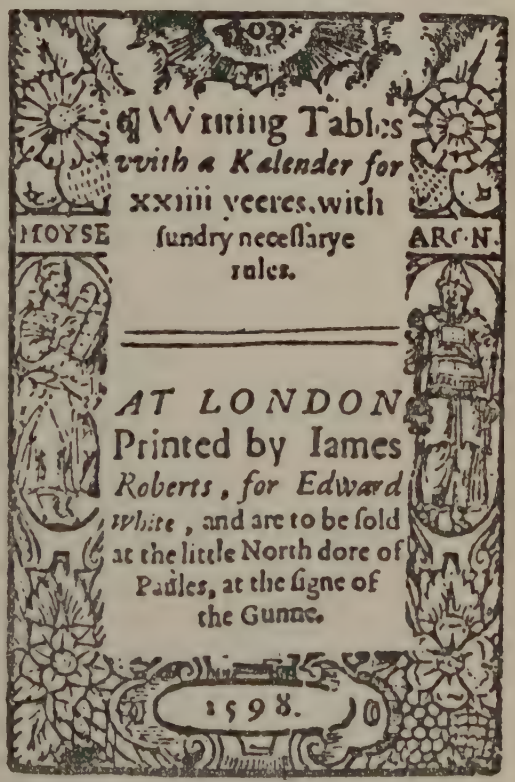
---

¶ *A Rule to knowe all the Vigiles & faſting dayes thorough-out the whole yere.*

¶ *With moueable Feaſtes, I will begynne*
As Eaſter, Aſcencion, & Whitſon Euen,
The Rogacion weke, in like caſe
Muſt bee kepte, as it commeth in place.
And the Apoſtles, as Peter & Paule
Iames, Mathy, with other mo.
Andrew, Mathew & the reſt as they fall
Bartholomew, Thomas, Iohn Bapt. alſo.
Simon & Iude & the Purification
The Birth of Chriſt & the Annunciation.
Ember, Fridayes & Lent as it doth come
The Euen of all Saincts, & ſo we haue done.

¶ A RVLE TO KNOWE how many days euery Moneth inthe yere hath.

¶ *Thirty dayes hath Nouember,*
Aprill, Iune & September.
February hath xxviij. alone,
And all the reſt haue xxxi.



Two of the earliest appearances of calendar mnemonics in English literature.

common practice. Apparently, some editions of the same book carried an alternative rhyme:

February has twenty-eight alone,
All the rest have thirty-one;
Excepting leap year,—that's the time
When February's days are twenty-nine

Except for the final lines, present-day English modifications of the rhyme are much alike, aside from one which is current in Chester County, Pennsylvania, among the Friends. It is of unknown origin:

Fourth, eleventh, ninth, and sixth,
Thirty days to each affix;
Every other thirty-one,
Except the second month alone.

Other lands, beyond England and the United States, are by no means exempt from the troubles of the Gregorian calendar, and in each we find some attempt to solve the problem. Nearly all foreign versions, where rhymes are used instead of other devices, parallel closely Grafton's English original, even to the inclusion of November in the first line. This leads to the thought that translation took place, in one direction or the other. For instance, take these three variations:

SWEDISH

Trettio dagar har november,
April, juni och september,
Tjuguatta februari allen,
Alla de ovriga trettioen.

ITALIAN

Trenta giorni ha novembre
con april, giugno e settembre,
di vent'otto ve n'ha uno,
tutti gli altri ne han trentuno.

SPANISH

Treinta dias trae noviembre
con abril, junio y septiembre,
los demas traen treinta y uno
menos febrerito el mocho
que trae veintiocho.

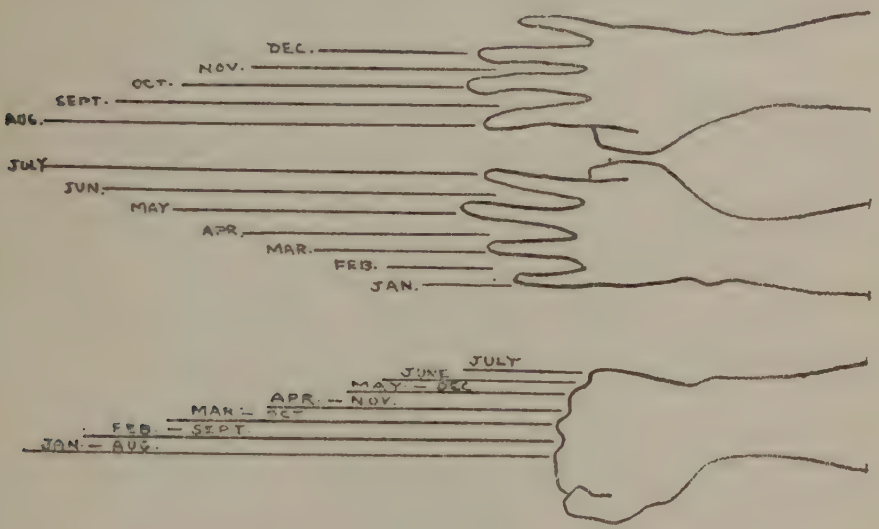
It is interesting to note the changes made from language to language, in order to retain a perfect rhyme. The Italian version, for instance, speaks of a month of 28 days, without naming which one, while the Spanish version refers to February as *el mocho,* "the cropped."

In a number of countries, chief among them France and Germany, lingual devices for the recalling of the lengths of the months are unknown. However, the people of these countries employ one of the several varia-

tions of an ancient manual method, which serves its purpose quite as well.

The fist is clenched, and the months are counted off in succession on the knuckles and in the spaces between them. Beginning at the knuckle of the index finger, those months having 31 days fall on a knuckle, and those having 30 days, or less, into a depression. July is on the little finger; August, like January, is on the index finger, and the count is repeated once more through to December. This is the German method—also used in Mexico, and in parts of South America and France.

A second method, more widely used in France, consists in counting off the months on the digits of both hands (with the exception of the thumbs),



and the spaces between the digits. July, then, falls on the index finger of the left hand, and August falls on the index finger of the right hand. Being on separate hands, these two fingers are regarded as having no depression between them.

Since the lengths of the months are of purely arbitrary allotment, there is no reason why we should tolerate the faults of the old calendar, except for the fact that, until recently, there has been no concerted action to introduce an orderly arrangement of the months.

In The World Calendar, a new timing system scheduled for early adoption, the first month of every quarter-year is long—31 days, and the following two are short—30 days. The enactment of this sensible method of time-keeping would obviate the use of crazy rhymes and manual devices and render them museum pieces that, in a progressive world, they should rightly be.

YUGOSLAVIAN DIFFICULTIES

By CAPTAIN D. M. NINKOVITCH

Eminent Lawyer of Belgrade, Yugoslavia

THIS country of Yugoslavia is a composite, multireligious state "blessed" with no less than four different calendars. The multiplicity of time-systems causes many inconveniences in a nation where religious feeling is strong and passions run high. Powerful traditions and deep-rooted superstitions turn daily life into a really unpleasant puzzle when it comes to questions of holy days and observances.

We have, of course, a state calendar which, although it does not say so openly, is Gregorian. Its chief duty, when it was officially adopted, was to swallow, somehow or other, the accumulated 13 days' difference between the Julian calendar of Eastern Europe and the Gregorian calendar of the West. It did this, but nothing more, as everything within the country went on as of old. In actual practice, the state calendar is observed only by government employees, and by them only in their official relations with the State. In their private lives, as in the lives of the bulk of the population, all daily reckonings are made by the Julian calendar.

The people who observe the Julian calendar are, of course, the followers of the Eastern Orthodox Church. All Moslems, though they are Slavs by origin, blood and tongue, cling doggedly to the lunar calendar imposed on them by Mohammed the Prophet. And all Jews, being mostly of the Sephardic creed, observe strictly their own Jewish calendar.

Here are the four calendars of common use. Serbian Protestants, being without any particular calendrical prejudice, are soberly ready to fall in with the majority in their community, and the Roman Catholics are a well-disciplined body sternly unwilling to compromise.

Some time ago I was in a party motoring down the Adriatic coast on business of importance. One of our stops was at Sarajevo, the town which will be remembered for centuries as the spot where the World War was kindled. We planned to reach Sarajevo on Friday morning, hoping to finish our business there and push on to another city in the afternoon. The day was still young as we reached the mountain pass leading to our destination, a picturesque valley justly named the "Gate to the Orient." Sarajevo lay beautiful below us, dotted with numerous slender white spires of Moslem mosques. Soon we passed the city gates and began looking for the address which had been given us.

Reaching the street, we found the premises closed. "Why?" I asked an old man calmly puffing at his long-stemmed silver pipe. His keen gray eyes looked at me in surprise. Then he drawled in his soft Bosnian accent: "Don't you know the Law of the Prophet, oh friendly stranger?"

I replied to him in his own idiom: "Well, not the fineness of it, I must confess, Grandfather, but the man I am looking for happens to be an Orthodox Christian and not a Moslem."

"What difference does that make?" replied the graybeard. "I know the man you are seeking. I know him well. And he would be the last man in the world to take advantage of his next-door neighbor by seeking business while the latter is engaged in his religious rites."

Further inquiries were of no avail. On turning to go away, I noticed that most of the shops in the town were closed, their shutters securely down.

Intrigued, I examined the name plates above the shutters of the various darkened shops. Many of them were written in Cyrillic characters, indicating that the owners were Orthodox Christians; others displayed picturesque Arabic lettering. But most of them were adorned with Hebrew signs, meaning that their owners would observe the Sabbath on Saturday. Yet here it was Friday, and all the shops were closed.

Later it was explained to me that the shop owners closed "out of sympathy to each other," on Fridays, Saturdays and Sundays, those being their respective days of observance. There was no compulsion in this. It was simply a case of tolerance turned inside out. No one wanted to hurt anyone else's feelings. So everybody observed a three-day week end, with resultant havoc to all the business life of the community.

Fortunately, this practice is not widespread in Yugoslavia, being confined to some parts of Bosnia and southern Serbia. Otherwise the economic life of the whole country would be crippled.

Such backwardness as we encountered in Sarajevo is, however, quite general in Bosnia. A friend of mine who is a judge of the Royal Court of Justice in Bosnia has encountered some very peculiar calendrical difficulties in administering justice. Under the law, his work is carried on according to the Gregorian or state calendar. Often in his long practice it has happened that a Moslem, when summoned before the court, voluntarily lays himself open to a substantial fine rather than appear on a Friday. It should be remembered that the Moslems are a very law-abiding and well-disciplined people. Yet a strange interpretation of dogmatic rules, combined with the observance of an archaic calendar, makes them break the law.

"Often," says my friend the Judge, "a sound legal case is lost to the applicant, simply because the day fixed for the hearing falls on a Friday. The applicant, being a good Moslem, just gives the court a miss, and the judge has no alternative but to issue a verdict against him on the basis of non-appearance."

The farm population of Yugoslavia probably suffers more severely from the nation's calendar muddle than any other class. Agriculture has long since ceased to be a happy-go-lucky occupation, carried out in a haphazard

manner by a carefree people. Modern agriculture requires more brains than muscles. If the farmer is to be successful he must lay down his plans months and even years in advance. He must arrange sowing rotations, selection of seeds, campaigns of fertilization. Many other operations connected with farming and stock raising can only be properly handled with the aid of careful calendar figuring, and also with the aid of statistical comparisons.

Now the moment we say statistics, we know that unless they are based on correct measurement of time, they are worse than useless. They will be badly misleading, unless we are on the square with time. The farmer is one whose eye is constantly on the sky, watching the passage of sun and clouds, the ebb and flow of the seasons. His very existence depends upon his making correct and timely decisions. Therefore an accurate, reliable and smooth-working calendar is essential to him.

In Yugoslavia, the present confused and obsolete way of reckoning time has many unnecessary but nevertheless unavoidable pitfalls. It is a common saying that "a faulty clock may make you miss your train and lose your temper, but an erratic calendar will make you lose your harvest and with it, your life's chance."

A world-wide reform of the calendar would be a piece of great good fortune for us in Yugoslavia. I do not know what position our statesmen take on the subject, but I know that every well-informed businessman is in favor of a speedy and thorough reform. We have examined the proposed World Calendar, and are convinced that it will go a long way toward assisting and facilitating human enterprise. It will also smooth over some differences between neighbors, thus promoting good-will between peoples. This alone is of great importance, and justifies our strong efforts to secure the adoption of The World Calendar. The sooner it comes, the better for all concerned.

NEW INTERNATIONAL ORGANIZATIONS

In the list of international organizations for the reform of the calendar, printed on Page 176, new committees are listed for Venezuela, Cuba, Dominican Republic and Ecuador. The Venezuelan committee is headed by Señora Maria Luisa Escobar of Caracas, a well-known international figure and one of the most distinguished women in South America. The Cuban committee is under the chairmanship of the Reverend Mariano Gutierrez Lanza, eminent astronomer, director of the Bélen Observatory in Havana. The calendar reform committee of the Dominican Republic has been formed under the presidency of His Excellency, the Most Reverend Riccardo Pittini, Archbishop of Santo Domingo and Primate of the Dominican Republic. The Ecuadorean Committee is headed by a distinguished diplomat, Dr. Rafael H. Elizalde, now Minister of Ecuador to Chile.

ARE YOU CALENDAR-CONSCIOUS?

By Rabbi Martin M. Weitz

Temple Beth Hillel, Kenosha, Wisconsin

WE ARE often told that when doctors attempt to "unload" a patient's mind, they use, as leverage, some such inquiry as "What is the earliest recollection of your life?" And often enough it serves as a searchlight that illumines the latest crisis, or as a needle that threads the earliest with the latest of personal problems unto the pattern of personality. When we span the sea of the unknown—the reservoir of the subconscious—to the inner isle of consciousness, as it were, then are we on our way to the discovery of a new world—another individual. The area of mental tension is not alone in being served by such inquiry, for self-discovery, clarification of motives, expression of personal friendships via mutually agreeable "first questions" and similar directives, are immeasurably enhanced.

When we addressed a communication to 37 contributors of the *Journal of Calendar Reform* recently, requesting the favor of a reply to "How I Became Calendar-Conscious," little did we realize that in four weeks the responses would vary from paragraphs to manuscripts, that so many of the replies would carry "calendar-consciousness" clear back to childhood's earliest experiences, and that so many of them would relate their present interest in calendar change, not merely to social needs for calendar reform as such, but to personal reactions in the almost forgotten horizons of past years. Neither did we realize that so many of the correspondents would "arrive" at The World Calendar by way of the 13-month calendar. Nor did we know that this verbal thread on "calendar-consciousness" could serve as such a vital cord in the Story of Time, and the Drama of Life.

This correspondence on "calendar-consciousness" convinces us that The World Calendar is, in itself, a creative evolution, for it, like Tennyson in *Ulysses*, could stress "I am a part of all I have met."

What, briefly, are the "parts" to be "met" in an appraisal of the replies to our simple inquiry in "calendar-consciousness"?

To respect anonymity for those who requested it, and at the same time to present a full cross-section of available contents, we shall essay to: (1) indicate the range of *vocations*, for life-work bears directly on "calendar-consciousness"; (2) gauge the *recency and intensity* of interest of the correspondent; (3) suggest major *motivations* responsible for continued concern in reform; (4) make an *appraisal* of conclusions.

A paragraph or two, then, about the various *vocations* represented. Primary in total replies would be the profession of teaching and the science of astronomy. Such letters were often explanatory and exploratory, always most adequate for our inquiry. Included among them were: three astronomer-mathematicians at universities in Iowa, Arkansas, and California; two general educators, one at Philadelphia and the other at Ithaca; two historian-researchers, one in Nebraska, the other in New York—a total of

seven. Second in number of responses were those of the ministry, for they included an Anglican Bishop, a Catholic Father, a Jewish Rabbi, a Humanist, and two missionaries-at-large, a total of six.

Washington contributed its quota with two significant letters, one from an official in the Department of Commerce and the other from a retired naval officer. Business and commerce yielded four notes, one from a New York contractor, another from a New York attorney, a third from a Connecticut accountant, and a fourth from a Washington statistician.

Journalists too are focal and vocal, in their concern for calendar reform. One 'letter-bearer' is associated with a leading international American newspaper published in Boston; another as the editor of a woman's department in an important magazine in San Francisco; a third has been an editor of several Catholic publications, while a fourth has served as editor for Jewish magazines. Club women have likewise not been remiss, being represented by an official in the General Federation of Women's Clubs.

In summary, our survey of vocations, though limited, reveals that all of the correspondents were not merely passive sympathizers but active contributors to the cause of calendar revision via personal conversation and public discussion in press, over radio, and on platform; that they hail from all parts of America, as far east as Boston and west as San Francisco, as far north as Wisconsin and south as Georgia; that they speak for themselves from life-labors in classroom, laboratory, observatory, pulpit, editorial office, law office, and business office. They reveal, too, the infinite possibilities of world-friendship, even via correspondence, revolving about a World Calendar, and inter-faith fellowship suggested even by this correspondence which included a Protestant Bishop, a Catholic Priest, and a Jewish Rabbi.

Recency and intensity of interest in calendation, on the part of our correspondents, in each instance, impinges on or derives from a negative response to the inconveniences experienced in the current calendar. For a more accurate as well as more adequate description of what essentially is a personal mood, it would be preferable to cite writer and letter directly to allow each to speak his own mind, in a sense, in his own way, rather than have an interpretation, or "misinterpretation," thereof. (We present only the most relevant statements, abstracted alphabetically, from letters that impose no restrictions upon us for publication of their contents.)

Dr. N. C. Abbott of Nebraska City: In the winter of 1907 . . . my explanation was not good and that night I started energetically to find out about the calendar.

Miss Elisabeth Achelis of New York: During my summer vacation in 1929, when I was sojourning at the Lake Placid Club, my attention was drawn to a lecture to be given by the late Dr. Melvil Dewey. His subject, "How to simplify life" appealed to me. In his talk he divided his theme into three parts: To simplify the English spelling, to adopt a uniform system of weights and measurements, and to improve our obsolete calendar. The last topic not only awakened my interest, but aroused my intense opposition as he proposed a 13-month calendar to replace the present 12-month year. . . . I left the lecture troubled. Instead of finding simplicity I found complications.

Dr. Robert G. Aitken of Berkeley, Calif.: I had become mildly interested in the subject of calendar reform nearly 50 years ago but did nothing about it until Eastman began to agitate his 13-month plan.

Prof. Bristow Adams of Ithaca: My interest in the subject of calendar reform

dates at least as far back as 1931 . . . as contributor of the first article in the first issue of the *Journal of Calendar Reform* . . . I tried to see whether I could make a reasonable presentation.

Dr. H. W. Bearce of Washington: Of course, even as a child I soon learned of the uncertainty of the opening date of the school year . . . The date was anywhere from September 2 to September 8.

Dr. A. M. Harding of Fayetteville, Ark.: All my life I have had a hobby . . . popular astronomy. While making a study of astronomy I naturally became calendar-conscious, for if we had no heavenly bodies moving around in the sky we would have no calendar.

Captain J. F. Hellweg of Washington: In the Navy, officers are always conscious of everything that in any way affects the Navy . . . As the officer in charge of the Naval Observatory, I am responsible for all means and apparatus for navigation, not only in the Navy but in the Merchant Marine. . . . And, of course, calendar reform is very closely related to the subject of time.

Mrs. Rowland H. Latham of Asheville, N. C.: The beginning of my interest dates to that of my husband who for many years has believed that a new calendar is needed, has accumulated books on the subject of Calendar Revision and has spread the 'gospel' among his friends whenever possible.

George M. Lamsa of Philadelphia: Some years ago I heard that there was a movement in this country attempting to change our present calendar to a 13-month calendar. I was very much disturbed about it. . . . I have always felt that the 12-month calendar is the best measuring yardstick of Time ever devised by man and I doubt if any other calendar, except the proposed Calendar Reform, will serve the purpose.

Rev. Henry Smith Leiper of New York: The absurdity of such a lack of harmony between calendars of different great sections of the world struck me fully.

Clyde A. Mann of New York: A publisher in Philadelphia who knew the unselfish effort of the President of The World Calendar Association, Miss Achelis, told me of the progress of calendar reform.

Herbert B. Nichols of Boston: I first became conscious that something was wrong with the calendar when, as a youngster, Easter always seemed to break in on a particularly interesting school project, and later during my college days, I studied the calendar more closely and found some of the things that were wrong with it.

Dr. Charles Francis Potter of New York: I presume that my interest in calendar reform dates back to my early childhood when I noticed that my own birthday anniversary came on a different day of the week every year and that, if it came one year on a Wednesday, the next year it was on a Thursday and the following year on a Friday, but in Leap Year it skipped a day.

Herbert H. Rapp of Danielson, Conn.: I first became interested in calendar reform through the campaign of accountants for the adoption by industrial and commercial concerns of the so-called natural year as the fiscal year. The natural year for any business ends with that month in which activity is at a minimum and inventories are low. The end of the calendar year is the most strenuous business period of the entire year for many concerns, and the time when it is most inconvenient to close the year's accounts. Moreover, through the adoption of the natural year, public accountants are relieved of the terrific strain attendant upon general calendar-year closings with the accompanying preparation of financial statements and tax returns. The natural-year closings permit distribution of this work through the entire year.

Rev. Edward S. Schwegler of North Collins, N. Y.: For quite a few years I have been engaged in writing on various subjects, mostly for Catholic publications; and so I am always on the lookout for some idea or subject that can be made into an article. And one of my specialties has been popular observances, holidays, superstitions, customs, etc.

If the writer (whose name begins with "W" and, therefore, should be listed here) be permitted to add his sentence or two, he would say: Primary interest, in childhood, was stimulated at home when Jewish festivals occurred in the secular calendar days and often weeks apart in different years. Interest was sharpened in

school when "thirty days hath September" had to be learned by rote rather than by "heart"—with no satisfactory answer as to why such months have such days. Experiences similar to these ignited further queries into a search for information which led, finally, to the *Journal of Calendar Reform* by means of a casual reference to "World Calendar" in (1936) *Chicago Daily News Almanac.*

"First exposures" in calendar reform, as in all matters public and private, are interesting, as self-revealed in the above selected and representative citations. In practically all instances, however, these first "exposures" were more than just limited inconveniences with the present calendar; they were crystallized experiences that permitted of and sought for a more perfect, and better-balanced calendar. We have observed how interest was first elicited, but what were the *motivations* involved and the appeals resident among the correspondents as well as in The World Calendar itself that made our writers not only calendar-conscious, but, as one words it, "calendar-*reform*-conscious"? How were passive simple impressions as expressed in above statements translated into sifted appeals and dynamic interests for calendar revision? Just what led them to The World Calendar as it is now offered?

Briefly, we might consider them under six major categories, ranging from the specific study of time to general humanitarian appeals. Some may have an overlapping of categories, and what are sources of motivations to some may be goals attained to others. We feel justified, nevertheless, in summarizing pertinent observations according to the *dominant* note of interpretation expressed in the manuscripts-in-miniature; we shall have to limit ourselves to characteristic comments in selected letters rather than to a thorough presentation of all.

What then are general motifs for *individual motivations* which led to reasonable and responsible acceptance of the proposed World Calendar on the part of so many of our correspondents? Permit us to list them, not in the order of their significance, but rather, of their reference. The least mentioned are offered first; while the last cited are those most referred to.

PURE STUDY OF TIME. "Man's measurement of Time" is another way of naming this impersonal approach to the calendar. As one of our contributors (Dr. Abbott) explains this perspective, it resolves itself about this philosophic inquiry: "Is Time actually the fourth dimension properly to be classed with Length, Breadth, and Thickness?" He posits this question for us, but it is one without an answer as yet. He illuminates the query by explaining the words *Year, Yore, Hour,* as of common linguistic derivation, and cock-crow, rope-burning, hour-glass, notch-cutting, stone water-clock (as at Canton) as common measurements employed by man in "marking" time.

His conclusions, shared by three others as a result of common deductions and similar experiences with differing systems of time-cycles in the Orient and elsewhere, is: Though Time, as such, is universal, man's systems for its measurement have been fragmentary in process and variable in purpose. Thus, Time-Consciousness led to Calendar-Consciousness, in time, on the part of several.

NEED FOR A "NATURAL" YEAR. This is best conveyed in remarks by Accountant Rapp, although two others agree: "A 'natural' year of equal quarters and equal halves is a practical necessity for accountants and for merchants, for then they can be

relieved of the strain in calendar-year closings (plus financial statements and tax returns) and be free to redistribute their load throughout the entire year, via a *fixed* and balanced calendar. A month of one year will be the same as the like month of another year; and holidays will be free from annual juggling on the part of Father Time for they too will be well integrated in a whole unit. The World Calendar, for them, fulfills the felt need for a 'natural' year within a fixed system, simple in spirit, balanced in form, and with least disturbance to our present measurement of time."

EXPERIENCE WITH COMPARATIVE CALENDARS. Practically all letters contained references to what we might term "Comparative Calendation," suggested by the phrase, "Comparative Religions" (and they are closely allied). Inasmuch as so many mention various calendars of the world as basic to their present calendric *weltanschauung*, it would prove instructive to follow some of their detours in the World of Time.

Calendric interest on the part of one, a school principal in the Orient, was deepened by a request of him to allow the Chinese to celebrate their New Year properly, and the Moros, Mohammedans, to observe their *Hegira* properly, at another date.

Another informs us that his experience with *two* Christmases and *three* New Years in *one* year in the Orient aroused him to the instability and intransigency of the current calendation. This mood was underlined when he discovered that the Eastern Orthodox Church, with an ancient calendar all its own, was willing to forego it for one more rational and more corrective of ancient errors, its own as well as those of other great religions.

One correspondent, as a student of the ministry, was disturbed by the variable dates for Easter. This led him to a study of calendars, lunar and solar, and to the advocacy of a system, as The World Calendar, which tries to adjust religious festivals and natural holidays to basic astronomical facts.

In addition to "arrival" through calendars other than their own, a few were "jolted" into comparative calendation when they were shuttled across the International Date Line and experienced the "unique sensation of going directly from Tuesday to Thursday, and of celebrating two Independence Days in succession."

Comparative calendation need not restrict itself merely to calendars of other countries and continents. The 13-month proposal is likewise eligible desiderata for Comparative Calendation.

The President of The World Calendar Association, Miss Achelis, arrived at The World Calendar because she "felt that fundamentally this plan (13-month) was all wrong." As she puts it: "Little less than a fortnight after [a lecture by Dr. Melvil Dewey] I found the solution. . . . On the page which *The New York Times* devotes to public letters to the Editor I read one in which a writer described a revised 12-month plan, favored in Europe, in which the year was arranged on the equal-quarter basis. I knew at once that this was the plan to work for. It was logical and simple, beautifully symmetrical and harmonious, perfectly ordered and equal. All of my previous irritation and alarm vanished like magic. But what was also important, at least to me, was the fact that my life previously somewhat aimless had suddenly become filled with a purpose. I had found my life-work and one which I knew would bring better days to man and his civilization."

The "intractability of 13" as a prime number caused many, as Dr. Abbott, to leave the camp of the International Fixed Calendar in favor of The World Calendar. Others, as Dr. Aitken, were convinced it would not be accepted because of the undercurrent of superstition connected with 13.

George Lamsa considers the calendar a "sacred monument" and on these grounds he contested claims of the 13-month advocates. A uniform and permanent World Calendar preserves the calendar as a "sacred monument" for him, but with the obviously needed air-conditioning and streamlining, so to speak. His experiences in "comparative calendation" in the Near East took him through duplication of dates for common celebrations among Christian denominations, but in calendar reform he sees conservation of an "ancient and sound institution which we have inherited from the past," synthesized with necessary improvements.

A clipping about the 13-month calendar on an editor's desk impressed Natural

Science Editor Herbert Nichols (*Christian Science Monitor*), but a cpoy of the *Journal of Calendar Reform* helped his opinion, says he, to favor The World Calendar, for "it was then easy to see the advantages of this plan over a 13-month system."

The 13-month proposal, to Dr. Wylie and Professor Flickinger, served as a direct challenge for counter-reply-and-counter-organization. At first in 1925, in *Science*, Dr. Wylie refuted an article favoring a 13-month plan. Then a group of university professors in various fields deliberately organized opposition to the 13-month people, but because Dr. Wylie was the single astronomer among these calendar crusaders, "most of the writing fell to my lot," some of which later came to the attention of The World Calendar Association.

"Comparative Calendars" too might be a term adequate to cover "Calendar Creators," for several among contributors to the *Journal of Calendar Reform* were, in some way, calendar-makers.

Miss Grace Hadley of San Francisco devised a "Three Month Art Calendar" where three months stand up at attention at a single glance, free from inflammatory design and discriminatory ad-copy. Each three-month area has an appropriate nature study above it, and appealing rhyme below it.

Dr. N. C. Abbott launched what he called the "Washington Calendar," a system of 13 months, each month comprising four equal weeks, and beginning on Thursday and ending on Wednesday. The 13th month was named Washington Month with a permanently intercalated Year Day and a conveniently intercalated Leap Day at the end of February, to help the Spring Solstice keep a permanent appointment with Nature, on March 23. Later he turned from the 13-month system to that of the equal-quarter arrangement.

The writer of this article makes confession that he too is guilty of what he chooses to call a "Social Calendar," preferably to serve within the framework of The World Calendar. Briefly, this aims to implement each American festival with specific programs of social reinterpretation for church, center and school by widening the significance of the spirit of each day as much as possible. Thus, Race Relations' Day would be observed—in selected poetry, discussions, music, etc.—with Lincoln's Birthday, Brotherhood Day with Washington's birth anniversary, and Peace Heroes Day with Memorial Day, "Y" Day and "L" Day, within The World Calendar, when accepted would be inter-faith, world-wide festivals of friendship—in short, they would be *international* holidays.

SIMPLIFICATION OF LIFE-PATTERNS. Modern life is agreeably simplified as well as enhanced by improved regularized calendation, added days of leisure, freedom from errors in dates, and other values. As Mrs. Rowland H. Latham expresses it: "I believe that a revised calendar would make life more simple and livable."

Dr. Arthur M. Harding found that lectures booked by mail do not always have date and day exactly—a problem eliminated, he avers, in a perpetual calendar. The need for simplification in his own life-pattern for exact, budgeted time led him to favor a permanent world-wide-simplified time-budget in The World Calendar.

Dr. H. W. Bearce specifies that comparative statistics is simplified by simplified calendation. He cites milk and egg production in February in comparison with January or March as an example to indicate an apparent yet artificially-created inconvenience which could be resolved by simplification of the calendar.

A different tendency toward simplification is observed by Prof. Bristow Adams, when he anchors his motivation to a felt need in the process of "speeding education to be able to state facts simply and understandingly, so that they may be easily grasped by the ordinary citizen." His interest in calendar reform grew from the desire to make a reasonable and *simplified* presentation of calendation as a mere experiment to a study of comparative calendars, and on to "enthusiastic advocacy of The World Calendar," as one that helps simplify the March of Time.

Simplification of life-patterns as stressed in George Lamsa's note mirrors the opinion of many, for a universal calendar with "even days in each month . . . will greatly facilitate worship and will also be helpful to business." This is apparent

too in Mr. Clyde A. Mann's observation that a simplified system of time has "value in bringing about much-needed improvements and decency in building operations."

In summation of "simplification" as a value, it is worth while to mention that one of the best manuscripts is entitled "Simplicity," while another ends with "*simple* system for measuring time." The search for simplicity, then is a primary force for "calendar consciousness."

INFLUENCE OF PERSONALITIES. Discovery of ideas and discovery of personalities have ever been synonymous. As the Bible has it: "Iron sharpens iron," so, too, we might have it: "Mind sharpens mind." Calendar consciousness implies a face-to-face relationship by interview and conference, as well as a fact-to-fact follow-up by calendar research. Influence of personalities, one on the other, might best describe the mood of a number of our notes.

A member of the Naval Observatory in Washington, who had done independent research in calendation, relates how a memorandum on calendation, later published, led to his acceptance of membership in the American Advisory Committee of The World Calendar Association, as a result of an interview with its president.

Another Washington correspondent was first intrigued by calendar changes because of an interview with Moses B. Cotsworth, originator and ardent advocate of a 13 equal months' calendar. After study of more plans he finally selected the Swiss Plan, improved in The World Calendar—a 12-month equal-quarter, perpetual calendar—as "by far the best plan that has been proposed." In his letter he expresses thanks to Mr. Cotsworth for the interview, which called his attention to calendar revision in general, but which resulted in his acceptance of a plan other than the one favored by Mr. Cotsworth.

A Southern club leader dates active participation in revision since 1937 when she represented the General Federation of Women's Clubs in calendar reform. Influence of personalities, her own influence with associates in club work, is no doubt manifested in the "strong sentiment for such a change" so "that American club women are fast becoming calendar conscious."

A contractor of New York informs us of two interviews which elicited his cooperation, one with a publisher in Philadelphia who told him of The World Calendar Association and its president, and the other with Miss Achelis. Says he: "I asked for the opportunity to meet her. . . . She it was who interested me in the importance to humanity of calendar reform—it was a wholly new idea and sound one."

HUMANITARIAN APPEALS: "World unity," "brotherhood of men," "evolution out of chaos," "common centers," "inter-faith friendship," "group good-will," are but a few of the many phrases, rather tributes, that appear in personal estimates of all correspondents as to the ethical-humanitarian impulses latent and living in The World Calendar. A few "lifted lines" will illustrate.

Mrs. Latham sees in "a calendar . . . world-wide in scope and adapted to the needs of all nations . . . the nucleus of world cooperation, understanding, and good-will . . . an instrument of world peace . . . the basis of its strongest appeal to me."

Miss Hadley observes that The World Calendar "will be put into use for the benefit of mankind, one divested of advertising, balanced in structure, perfect in form."

The present writer sees in The World Calendar a vehicle for greater social awareness, whereby the five-day work-week could be a permanent reality and old American holidays could be invested with new meaning, whereby mankind could enjoy a number of new week-ends, not merely days, of leisure and of new international days in spirit of world friendship and universal good-will.

More significant than any of the others, however, are the sentiments expressed in the last sentences of Miss Achelis, for to her calendar reform was no mere humanitarian impulse. To her it was a change from old and a challenge to new life-interests; it was a religious experience, as it were. As she pens it in her own words: "I had found my life-work. . . . For an instant I glimpsed a divine event and purpose, and I have followed that vision with increasing satisfaction and happiness."

A few pertinent observations might be penned here by way of general commentary:

1. All of the notes are from individuals who have been students of various world calendars and who have written or spoken in behalf of The World Calendar, for a number of years.

2. At least seven of the manuscripts mention a shift of loyalties, a change of heart, from the International Fixed Calendar to The World Calendar.

3. Six letters reveal that dynamic dislikes helped call forth equally dynamic likes, that intense and immediate opposition to the 13-month proposal helped deepen interest in and widen horizon for a worthy substitute, when it appeared, as The World Calendar. (Another way of wording it: "What gets our attention—good *or* bad, 'gets' us!")

4. Of the many words, "reform," "revision," "change," etc., employed by correspondents to indicate calendar-correction, "reform" was the one which occurred the greatest number of times. The ethico-humanitarian is first, and the commercial-statistical, second, among the many directives responsible for calendar-consciousness.

5. Many of our correspondents penned a portion of their remarks in a mood of humor suggestive of the fact that seriousness is served also by humor. A Californian informs us that she became first intrigued by calendar change when she served on a jury and in order not to be overbored by endless litigation and polished technical evasions, she studied the ad-filled calendars about the court room, surmised just what businesses had "business" with the city hall, and there and then resolved to develop a calendar free from making people want to buy things they did not need, and one that could, at a glance, give three months for the price of one! Later she sent her plan to a banker for his perusal, but it came back, politely but not profitably. . . .

An official of the United States Department of Commerce was "worried" into calendar change at an early age, for when school started differently on different years, a good six days evaporated from his vacation! "We never knew in advance whether a holiday would fall on a school day, on Sunday, or Saturday, and thus be 'lost' as far as vacation is concerned."

One of the responses carries the following "theological" observation: "I was born in a part of the Near East and there were several calendars in use. When the Roman Catholic Christ was baptized the Nestorian Christ was just born, and the Armenian Christ was to be born two weeks later. Jesus' death and resurrection were also celebrated three times during the year. This made mockery in the eyes of the Mohammedans whose prophet was born only once!"

In a similar vein another correspondent became calendar-conscious when he became calendar-confused, for in 1918 he "experienced two Christmases and three New Years, due to travel back and forth between Siberia

and China." In this instance, as in the above, he became: (1) calendar-conscious; (2) calendar-confused; (3) then calendar-*reform*-conscious!

Still another tells us that he was for calendar change "out of sheer perversity," that he favored the 13-month proposal just because his fellow faculty-folk were "dead against it." The World Calendar elicited his full approval and he could no longer, "out of sheer perversity," advocate the 13-month system.

A mid-Westerner confesses that he became calendar-conscious in a Caesar class, when he could not answer a simple question asked by one of his alert students, and which he heard years before when he was a student. He blushed that morning, but natural color came back the next day because of midnight oil that evening. He reported in full on the calendar at the next session—and since then has always been at least a lesson ahead of his class and a calendar ahead of his time, for he is now an ardent "teacher" of The World Calendar in Mid-America!

YUGOSLAVS SLOW TO DISCARD JULIAN DATES

Belgrade (Yugoslavia) *South Slav Herald*

"LAND OF CONTRASTS" is a hackneyed phrase usually applied to life and landscape. In Yugoslavia it connotes two scripts and two calendars—both confusing to the visitor. The two scripts are the Latin and the Cyrillic, the latter with an alphabet similar to the Greek but nearer the Russian. A man may legally write his name in either, and documents written or printed in either are equal before the law.

It is the same with the two calendars: the Julian and the Gregorian. Thus Yugoslavia can celebrate two Christmases and two New Year's Days, where most countries have only one.

In the old Julian calendar all the centennial years were leap years, and for this reason toward the close of the Sixteenth Century there was a difference of ten days between the tropical and calendar years; or in other words, the equinox fell on March 11 of the calendar, whereas at the time of the Council of Nicea, A.D. 325, it had fallen on March 21.

In 1582 Pope Gregory XIII ordained that October 5 should be called October 15, and that of the end-century years only the fourth should be a leap year.

This change was adopted by Italy, France, Spain and Portugal in 1582; by Prussia, the German Roman Catholic States, Switzerland, Holland and Flanders on January 1, 1583, Poland 1586, Hungary 1587, the German and Netherland Protestant States and Denmark 1700, Sweden (gradually) by the omission of 11 leap days, 1700 to 1740.

Great Britain and Dominions (including the North American Colonies) adopted it in 1752, by the omission of 11 days (Sept. 3 being reckoned as Sept. 14).

The Gregorian calendar was adopted by Japan in 1872, China in 1912, Bulgaria in 1915, Turkey and Soviet Russia in 1917, by Yugoslavia and Rumania in 1919, and by Greece in February, 1923. The Russian, Greek, Serbian and Rumanian Churches did not abandon the Julian calendar until May, 1923, when the Gregorian, slightly modified, was adopted by Greek and Rumanian churches.

The difference between the old and new style was 11 days after 1700, 12 days after 1800, and has been 13 days since 1900.

WHEELS WITHIN WHEELS

The Story of the Mayan Calendar

By Dr. Gustavus A. Eisen

Since graduating from the University of Upsala, Sweden, in 1870, the author has had a remarkable career in archeology, research, travel and authorship. He has lived in the United States since 1873. While serving as curator of the California Academy of Sciences, he was the originator of the Sequoia National Park. He is a member of many learned societies in America and Europe, and is the author of more than 100 books and monographs.

THE Mayan calendar was literally a case of wheels within wheels—a mathematical clockwork that ticked off the days, years, and centuries. It was an incredibly intricate system, but it worked with absolute accuracy. The people who devised it had a passion for numbers, and the calendar was their great masterpiece. As a piece of astronomical calculation it is utterly without equal.

Not only were there wheels for such ordinary units of time as the day, the month, and the year, but there were others as well for tallying 13-year and 52-year periods. Working from an ideal conception which reached forward and backward in time for tens of thousands of years, the wheels accounted for every date in their recorded history, every date imaginable.

The Mayas were not content with solving the riddle of the solar year with an exactness greater than any other calendar. They went farther and devised calendars that counted the days by the moon and by Mars and by Venus. These, too, were wheels—wheels within wheels—and they all revolved in a beautiful and fascinating mathematical harmony.

Some of these calendars, we suspect, were designed out of sheer virtuosity, out of a love for numbers. For this we can only suspect, because our knowledge of the Mayas and their calendars, is sadly incomplete.

What we know of them has been worked out from three codices or manuscripts—the only ones that escaped the destructive fanaticism that followed the conquest—and from the inscriptions on monuments. Archaeologists the world over have labored with the problem and although the differences of opinion among them are still considerable and there are many points which will remain dark unless new evidence comes to light, we know enough today to describe the Mayan calendar in its broad outlines.

The Mayas, it seems, believed that the world as visualized by their calendar was designed to go on for 384,000 years.* Of this period 96,000 years remained, and these were the years of their calendar. How they managed to arrive at these numbers we do not know. What matters is that they fashioned their calendar so that years, centuries, millenniums of

* J. T. Goodman, Maya Inscriptions, Biologia Centrali-Americana, London, 1897.

solar, lunar and the other calendars came to a neat and logical ending at the end of an imaginary 384,000-year period.

The year in this ancient kingdom was, it is interesting to note, actually what it was in ancient Egypt. Situated thousands of miles apart, both countries computed the year to have 360 days. The five days that remained were regarded by the Mayas as evil days, and no one worked, started on journeys, or got married during this extra period. The Egyptians considered these days as festival days under the dictum of the priests.

Whereas the Egyptians had 12 months of 30 days, the Mayas had 18 of 20 days. The names of the Mayan months were the following:

Pop	Zota	Yaxkin	Yax	Mac	Pax
Uo	Tzec	Mol	Zac	Kankin	Kayab
Zip	Xul	Chen	Ceh	Muan	Cumhu

The Maya priests regulated their calendar according to three major and several minor systems. In the first system they made use of the sun year of the planet Mars with its 720-day year. In the second system they used the sun year of the planet Venus with its 584-day year, a day being added every fourth year very much as in the Gregorian calendar. In the third major system they stored up the quarter-days until there were 13 of them and then they were added to the fifty-second year. The 52-year period was known as a calendar "round" and was unique to the Mayas. Some authorities believe the days were stored until there were 25 of them, when they were added to a 105-day period. To a period of 93,000 days the Mayan priests correctly added 62 leap-year days, after which a new Katun "wheel" began. The names of the 20 days were as follows:

Imix	Chicchan	Muluc	Ben	Caban
Ik	Cimi	Oc	Ix	Ezenab
Akbal	Manik	Chuen	Men	Cauac
Kan	Lamat	Eb	Cib	Ahau

The days proceeded in a continuous stream, which would have presented no difficulties for our understanding but for the existence of the little Mayan month of five days. The march of the days did not pause there but went right along. And so it came to pass that there could be no recurrence of a date identical with any other until the end of a 52-year period or calendar round when the sequence of days began again. The seasons received little attention. With no recurrence of identical dates from year to year, the seasons soon were out of step with the calendar in a manner similar to the present Mohammedan lunar calendar.

The 20 days revolved against a wheel of 13 numbers. Unlike our calendar, however, where Sunday is always the first day, the Mayan equivalent for Sunday, Imix, might be the first and it might be the tenth. The 13-day period has been described as the Mayan equivalent for a week, but it was apparently considerably different. According to Dr. Herbert J. Spinden.*

* H. J. Spinden. Reduction of Mayan dates. Peabody Museum, 1924.

the day was the real unit of the Mayan calendar, serving as a check against the months in chronicling the passage of the solar year. Interesting also is the fact that no day was recorded as a day until it had definitely passed. The calendar worked on the astronomical principle of elapsed time. Thus the first day of a week, month or year was always *zero*. Day number one began where we would begin number two.

There are many other intricacies. For example, one of the Mayan Cakchiquel tribes operated with a 400-day year. And there is recorded that the Mayan priests met and reformed the calendar. But like all reforms it was only partially successful and the old calendar continued to be used by the people in their daily life along with the new one.

To clarify the Mayan conception, here is a table of Mayan time-units:

1 k'in (sun)	1 day
20 k'in	1 uinal (moon) or month
18 uinals	1 tun (stone) or year of 360 days
20 tuns	1 katun or 7,200 days
20 katuns	1 baktun or 144,000 days
20 baktuns	1 pictun or 2,680,000 days

Dovetailed with the solar year was another which reckoned time by the moon. This was known as the sacred year and was employed by the priests for a definitely religious purpose. This was a year of 13 months—first of the 13-month calendars—of 20 days each; in other words, a 260-day year.

On the Mayan monuments we find the lunar year represented by the figure of a man carrying a torch which is familiar to archeologists as a "burner." These years are known as burner years. Eighteen burners have been calculated to equal 13 years of 360 days; 73 burners equalled one calendar round of 52 years or 18,980 days.

Precisely what the relationship between the solar and lunar calendars was remains a mystery, although it seems to have been used to develop a system of cycles. These were further complicated by reference to the orbits of Venus, Mars and other planets. Various theories have been advanced to account for them. A few writers, notably P. W. Wilson, dismiss them as "ornamental" and as a perfect example of "pedantry."

Enough, however, has been set down here to make clear that this calendar of the Mayan civilization did succeed in measuring accurately the march of the earth around the sun and in dividing the period ingeniously. To go beyond that is to become involved in an arithmetical labyrinth.

Perhaps the finishing touch has been supplied by Charles Imeson, an archeologist, who has designed an immensely interesting device to reproduce physically the wheels within wheels of the Mayan calendar. It operates on the principle of the slide rule. All the interested reader need do to discover a date in Mayan history is to move three or four wheels, adjust two pointers, and then perform four problems in arithmetic.

A GREAT INDUSTRY SPEAKS

By CLYDE A. MANN

Managing Director of Certified Building Registry of U. S.

UNCERTAINTIES and irregularities in our calendar add appreciably to the persistent lag in the new building activities which government, finance and industry are trying to stimulate because active building so directly reduces unemployment, and is a key to general business recovery.

Notwithstanding enormous potential shortages of housing, creating a vast potential market for new building, the remedies thus far provided on a heroic scale have not yet overcome the various handicaps to building revival. Some of these handicaps are major in effect and influence. Some are minor. The inefficiency of the calendar is not such a minor one that it does not involve losses which are important. Removing various minor handicaps will do much to eliminate major and more perplexing ones.

Under normal conditions, building activity in the United States runs to stupendous totals of payrolls and purchases—so stupendous that no other industry can fail to feel acutely its prosperity or depression. Any factor which retards the revival of building activity also retards the recovery of general business.

With the need so great for getting all grit out of the stupendous wheels of building activity—those of finance being the greatest and most potent of all—it is pertinent to point out the overlooked defects in time measurement.

Going back to the year 1929, peak volume of building for one year was 11 billion dollars. The labor expenditures in that total were 6.9 billions, and usually are at least 60 per cent of building costs. And it is in labor that the inefficiencies of the calendar strike most directly and obviously.

For example, take the "estimaters," both for the architects and bidders, who must prepare estimates of cost for new construction, including labor costs. The Gregorian calendar introduces a large and very annoying element of uncertainty. Of the probable number of working days on the job in hand, what will be the productive value of the days? For these days are not of equal value—no more in construction than in merchandising. There are good days and bad days, days of headaches and days of delays. On what days will holidays fall during the period of construction? Are there any 5-Saturday or 5-Sunday months to be provided for?

If the Fourth of July comes into the period of construction, on what day of the week does it fall, and what is the productive value of the days immediately before and after that particular holiday?

And after all the figuring is done, there must still be wide allowances

for error, because the figures depend upon the date of starting, and that, of course, is problematic. Why, the distracted estimater will wonder, haven't the weekdays and days of the month long since been riveted together? Why do holidays float so insanely around from year to year?

Of course, the calendar "grit" in building involves delivery of materials. Holidays affect transportation and freight. Therefore possible delays in delivery must be allowed for, with the expense of paying labor while it stands idly waiting for materials.

In all cost calculations, months-of-work periods must be taken into account. Then comes the question of what kind of months they are—28-day, 29, 30 or 31. If construction periods are likely to run through part of one year and part of another—as, for instance, a 90-day construction job undertaken in November—then a new set of variables becomes operative, and there is more guesswork, doubt and uncertainty.

Inability to estimate calendrical irregularities accurately in terms of dollars and man-hours results in an "error allowance" that is highly speculative. The cautious estimater plays safe, and then finds that the job has gone to a rival contractor who risks more. Or if he is estimating on behalf of an architect, his estimated cost may be absurdly out of line with actual bid figures and result in bitter criticism.

Once a contract job is started, with premium on speed in completion or penalty for delays, calendar irregularities become financial headaches. The productive value of various working days becomes a specific factor of cost, and too often one in which the results are quite different from the "estimated" factor.

Many architects and engineers on the vast housing and construction projects undertaken by the P.W.A. and the W.P.A. during the past two years have complained of painful experiences with 5-Sunday months and other calendar vagaries. And there was reason for complaint.

Another spot where calendar irregularity has a baneful influence is in payment of rents, interest, insurance and contractor's bills.* Unequal length of months and quarters causes definite losses, some trifling in themselves but enormous in their aggregate. The lack of a fixed relationship

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*If a structural engineer should permit a deflection to the amount of 1% to enter into his calculations for the height of an Empire State building the tip from vertical would be absurdly obvious to the man in the street. The top would be ten feet out of plumb. It would not be tolerated. But the variants of 1%, even 2%, in totals of receipts or disbursements of one quarter of the year as compared to another quarter one day longer have been allowed to persist. No single country could change the calendar used so long. But the need that it be done is as great as holding tall buildings to precise perpendicular.

In the comparisons of months, of course, the difference of one, two or even three days in totals of computations represents a still more serious percentage of "deflection." If we could rely upon a month being a span of 30 days, or at most 31 days, a degree of precision and regularity would be obtained that would minimize the variants between any month. Under the Gregorian system, the 28-day February when compared with the 31-day March that follows it, or the 31-day August (the second month of the second half of the year) the difference of 3 days represents no less a "deflection" than 10%. Precision for work? Ask an engineer.

If any building's roof line rose and fell in its length 6% in some places, ten in others (as month spans do) the result would resemble the Atlantic City boardwalk after a terrific storm has torn the underpinnings loose.

between weekdays and month-days means payments frequently retarded two to four days, and the interest charges piled up by this aggregate of oft-repeated delays amounts to many millions annually. Payments fluctuate similarly around legal holidays.

Now this financial "lag" may seem a small matter. It is a financing cost that has long been accepted as inevitable in the machinery of mortgage and management. Yet it would be greatly abated under the proposed new calendar. And, remember, it is one of the factors that helps to discourage private capital from venturing into the building field, the crux of the present depression.

The variations in length of quarterly periods, under our present calendar, amount to as much as 2, 3 or 4 per cent. These percentages, when applied to sums of money as large as 100 or 500 million dollars, are very important, and provide a hazard in precise comparisons of profit.

There are listed 49,000 industrial plants which find their market in the building field. I venture to predict that each one of them would find some definite benefit from the proposed revision of the calendar.

There were enumerated in the last Census of Manufactures 145,000 architects, engineers and draughtsmen employed in construction design. Every one of them suffers to a very appreciable amount from the guesswork factor which the present calendar imposes.

It is obvious that the whole building industry has a keen and genuinely economic interest in the proposed improvement of the calendar. While no intensive research into the probable benefits has yet been made, it is obvious even to the cursory student that existing inefficiencies in time measurement exact their toll in time and money, that they increase the chance of error in many computations, that they make forecasting more difficult. These facts are axiomatic, and will most certainly be accepted by any group or committee that undertakes consideration of the subject. No serious obstacle to revision of the calendar can be found in this department of human activity.

Support for calendar reform has been persistent and powerful within the building industry for more than 10 years. Even the proposed 13-month plan, unworkable as it was, received the most careful study and consideration. The industry eventually rejected it, but not without weighing all the factors involved. The reasons against the 13-month calendar were compelling—the grooves in which construction, insurance and financing move are so deep that it would have been impossible to change the gears from 12 to 13. But the clever and simple and effective changes which were first proposed by Abbé Mastrofini* for adoption in the Gregorian formula answer many of our needs and requirements.

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*The proposal was that one or two extra days be added to a 364-day year, by which the annual calendar becomes steady and reliable.

CHURCH AND STATE COOPERATE

By P. W. Wilson

(From *Social Progress*, Published by the Presbyterian Church in the United States of America)

CIVILIZATION is suffering from wars and rumors of war. Peace also mobilizes her forces and wins her victories, frequently unheralded but of a permanent benefit to mankind. The movement in favor of calendar reform is of interest to many of us, not only because of its importance to finance and industry, though that is obvious, but because the calendar ought to be an expression of good-will by people of all religions, races and nations.

The movement is emerging once for all out of the uncertainties of pioneering propaganda, and it is to be appraised henceforth in terms of constructive statesmanship. The difficulties to be faced and the inertia to be overcome are not to be underestimated. But the task that lies ahead is largely legislative and practical. The question is how the reform is to be completely achieved, and it is thus a suitable moment for a review of the position.

Two aims are included in the program of advance. First, there should be one calendar for the general use of mankind. Secondly, this calendar should be the best that the mind of man can devise.

The first of these aims is substantially achieved, and with a rapidity that is astonishing. For thousands of years there have been numerous calendars, Hindu and Moslem in India, traditional calendars in China and Japan, the Mohammedan calendar in Turkey. All of these calendars with their lunar complications have militated in modern times against the adoption of a solar calendar based upon the simplicity of the sun. All of these calendars are either abandoned for general use or are regarded as progressively obsolescent. East and West accept the existing Gregorian calendar and so declare that only an international calendar can be permanent in the modern world.

Within Christendom we see a similar revolution in the measurement of time. The Eastern Orthodox churches had refused to surrender the Julian calendar, or Old Style, and submit to the New Style authorized by Pope Gregory XIII. This situation is virtually at an end. Russia and Greece differ widely in their ideologies. But, like Eastern Europe as a whole, they have arrived at the same decision to accept the Gregorian calendar which the world as a whole is using.

The world has thus arrived for the first time at the general conclusion that a world calendar is essential to civilization. The age-long era of local, conflicting and frequently indeterminate calendars has been brought to an end. Special communities may retain the use of such calendars for pur-

poses of significance to those communities. But the general business of life requires an international measurement of time.

One conclusion leads to another. The necessity for a world calendar and its use throughout the world means that imperfections ought to be eliminated. We cannot expect the Chinese and other great populations now facing the future to be content forever with a calendar that is so changeable and with irregularites of half-years, quarters and months which have no meaning, even in tradition, outside the old confines of the Roman Empire. The reform of the calendar is rendered inevitable not only by the accumulating use of the calendar throughout the world, but by a calendar that meets more adequately modern needs.

Numerous adjustments of the Gregorian calendar have been brought forward, discussed from every point of view and subjected to critical analysis. Out of the medley of suggestion and argument, one proposal—The World Calendar—has survived the others. It is the only proposal now receiving serious attention, nor does there seem to be any likelihood that, in years to come, any other proposal will take its place. The question is no longer which is the most perfect of proposed calendars. The question is whether the most perfect of these calendars, having been selected, shall be added to the benefits of mankind.

International legislation is a cumbrous process. Misunderstandings arise and have to be allayed by friendly explanation. In the case of the calendar, the process is further complicated by a consideration of traditional and ecclesiastical importance. For thousands of years, the calendar, whatever form it has assumed, has been among the responsibilities of organized religion. It has been enshrined within temples, churches, mosques and synagogues, and this is true of the comparatively modern calendar with which our present generation has to deal. The Julian calendar, known as Old Style, was arranged according to scientific advice by Julius Caesar as Pontifex Maximus. The revison of this calendar, known as New Style, is named after Pope Gregory XIII, who included the title of Pontifex Maximus among his ecclesiastical dignities.

This background cannot be ignored, especially at a time when the world is much concerned over the relations between church and state—the spiritual and secular organizations of society. In the reform of the calendar both of these authorities are inevitably involved.

It is thus encouraging to realize the attitude of leading religions to The World Calendar. Within historic Christendom, the position of the Roman Catholic Church is that the proposed changes though challenging tradition do not transgress any matter of faith. The reforms have won a remarkable measure of approval in the Eastern Orthodox and Anglican Churches, and in the Protestant Churches as a whole. On Sabbatarian grounds the Seventh-Day Adventists and more conservative Jewish leaders have still

to be convinced. . . . The acquiescence of Asia in the existing Gregorian calendar is a *fait accompli.* Asia has thus every reason to welcome improvements in the Gregorian calendar—the twelve adjusted months, the equal quarters and the perpetual year. Whatever the Western World achieves will be of advantage to the world as a whole.

There are many ways in which a given end may be achieved. Two principles may be stated. First, The World Calendar, however it comes to be adopted, must be approved by the *civil authority,* either the League of Nations or a group of nations if the League delays action. Secondly, the fixing of Easter and all other arrangements for religious observance fall within the *undisputed province of the churches.* Thus the prerogative of spiritual authorities to deal with the ecclesiastical almanac is respected.

Among the spiritual authorities within Christendom, there is a remarkable measure of agreement over the fixing of Easter. It cannot be made too plain, however, that The World Calendar can be adopted for civil and ecclesiastical use without prejudice to the fixing of Easter or any other arrangement of the Ecclesiastical year which may be deemed advisable by the churches concerned.

There is today a great opportunity for using calendar reform as an avenue to reconciliation. Let the churches tread the same path of progress to the same useful end. Let the nations also tread this path. It will then be apparent that religion and citizenship are not of necessity opposed but can cooperate in a field where occasions of embitterment need not arise.

OBITUARY NOTES

DR. WILLIS R. GREGG, Chief of the United States Weather Bureau, died on September 14, in Chicago. He was 58 years of age. Dr. Gregg, a keen student of calendar reform and an advocate of The World Calendar plan, had been a member of the Association since 1931.

JAMES H. PRESTON, twice Mayor of Baltimore and Speaker of the Maryland House of Delegates, died on July 14. He was 78 years old. He was a member of The World Calendar Association for several years.

PROFESSOR JAKOB KUNZ, prominent mathematical physicist, a member of the University of Illinois faculty for thirty years, died at Urbana, Ill., on July 18, aged 63 years. His interest in calendar reform dates from the early part of 1932.

CAPTAIN NATHANAEL GREENE HERRESHOFF, designer and builder of American Cup yacht defenders, died in Bristol, R. I., on June 2, aged 90 years. He was a member of The World Calendar Association for several years.

OTHER deaths among the membership of The World Calendar Association during the past few months include: *John Clyde Oswald,* Managing Director, New York Printers Association; *Rev. Father Leo Molengraft,* Cincinnati; *Adolph Lewisohn,* business man and public benefactor, New York; *Prof. Eugen Wurzburger,* University of Leipzig; *Capt. Gordon W. Haines,* U. S. N., Savannah.

WANTED—PUBLIC SUPPORT

By A. ATKINSON

(From the British Review, *Nineteenth Century*, September, 1937)

IT IS evident that a good deal of propaganda work remains to be done before the multitude realizes the amount of time and money wasted by the inconveniences and irregularities of the present calendar. This is, after all, a human device, which, except for the length of the day and the length of the year, is not astronomically determined. Changes have been made before and can be made again as soon as the public is convinced of the advantages to be gained by reform. Assuredly there is no reason why we should continue to employ an almanac derived from Egyptian priests, Julius Caesar, and mediaeval Pontiffs, when it is found to be inconvenient and obsolete. It is objected by those who are opponents of all reform that such an alteration in the calendar will cause another *annus confusionis* compared with which the inconvenience occasioned by Gregory XIII's reforms was trifling. It is more probable, however, that the public will rapidly become used to the change, as they have done in the case of summer-time. Especially will this be assured if the alteration is made in a year when January 1 falls on a Sunday.

The subject, it is claimed, has now become one of international importance. This being so, and because the proposals for reform began with the advocacy of a fixed date for Easter, it may be convenient to take this as a starting-point; a chronological approach befits the theme. The whole trouble arose from the fact that the Julian calendar, which dated from 45 B.C., and on which the ecclesiastical calendar was based, presupposed that the solar year was equal to 365¼ days. This was too long by 11 minutes and 14 seconds. During the lapse of centuries the date of the spring equinox fell earlier and earlier in the year, and it had long been manifest that the calendar moon and the moon of the heavens no longer coincided. By 1582 the equinox had retrograded from March 25, the date on which it fell when the Julian calendar was introduced, to March 11. The new moons were obviously occurring before the dates marked by the Golden Numbers in the ecclesiastical calendar. In other words, when the calendar marked March 21 the real equinox had been passed by ten days. Thus Easter was celebrated too late, and in time would have been kept one, two, or three months after the astronomical date.

Gregory determined to give *éclat* to his reign by undertaking a reform too long delayed. The Pope's aim was to restore the equinox to March 21, the date on which it fell at the time of the Council of Nicæa in 325. In this he was advised by Lilius the astronomer of Naples and by Clavius the mathematician. It is the tables of Clavius which are still in use. Ten days

were omitted from the calendar, and October 5, 1582, was reckoned as October 15. The change was promulgated in a Bull, *"Inter gravissimas,"* of February 24, 1582. Thus occurred the *"annus confusionis,"* for the omission of these ten days has been the cause of numerous mistakes on the part of historians, since they have frequently forgotten that the days October 5-15, 1582, never existed. Clavius rejected the Golden Numbers which had failed and substituted another set of numbers called "epacts." These had been known before the Gregorian reform, though not in use officially; they give the age of the moon at the beginning of the year. The calendar moon was disassociated by Clavius from the moon of the heavens. It is thus a purely artificial moon and is best regarded as independent of celestial phenomena, for the astronomical moon may differ one, two, or even three days from the moon of the calendar. The complexity of the calculation was enhanced by the desire to prevent the concurrence of Easter with the Jewish Passover, which Christian prejudice after the early centuries would not tolerate. Gregory's reforms were adopted at once by Catholic countries, but it was more than a century before their example was followed by most of Protestant Europe.

England, with mistrust of anying of Papal origin, did not follow suit until 1751. By this time the inconvenience of having a different time system from the rest of the world could no longer be ignored. It fell, strangely enough, to the lot of Lord Chesterfield to second the introduction of the Bill for the adoption of the Gregorian calendar in the House of Lords. Chesterfield's Bill enacted that the legal year 1752 should begin on January 1 instead of March 25, and that September 14 should follow September 2; but the prejudice against anything of Papal origin was still so strong that the method of calculating by the Golden Numbers instead of by epacts was retained. The only difference is that the Golden Numbers now indicate the full moons instead of the new moons, as was the case in the old Roman calendar. The Golden Numbers have still to be shifted at the centurial years. It is unfortunate that the opportunity of revising the tables and rules and substituting the method of calculation by the epact number was missed on the occasion of the revision of the Prayer Book in 1927. For, abstruse and cumbersome as the chronological apparatus is, the tables afford only some partial explanations: a fuller understanding of the matter must be sought in other works of authority, which, for the most part, are written in foreign tongues and are not easily come by.*

In May, 1922, the International Astronomical Union declared in favor of the stabilization of Easter, and the League of Nations took up the subject in 1923. Many chambers of commerce, trade union congresses, and other influential organizations have passed resolutions stressing the

* The leading authority is the monumental work of the Benedictine fathers who have specialized in calendrical matters—*L'art de verifier les dates. Lalande Astronomie* (tome ii.).

need of reform. It is, however, the attitude of the Vatican which especially demands detailed consideration. In 1896 M. M. Foerster, director of the Berlin Observatory, addressed a comprehensive series of questions to many influential scientific, political, and religious persons on the subject of a fixed Easter. Rampolla, Secretary of State to Leo XIII., replied on the Pope's behalf, under date May 6, 1897, as follows*:

> If we had to consider the reforms proposed solely as a question of social order the project would certainly merit a favorable approach. But the Church must also regard the matter from the standpoint of tradition and the connection which the Easter Festival bears to the death and resurrection of the Savior. Above all, the Holy See must avoid any danger of introducing into the Christian world grave divisions as the result of change. At any time if this danger can be avoided, and if there were a universal demand for the stabilization of Easter owing to the growth of public opinion enlightened by men of science, the initiative in a reform of this sort could then be considered by the Holy See in a General Council.

Pius XI. made a similar response through the Papal Nuncio at Berne, Mgr. Maglione, to the League of Nations on March 7, 1924:

> The Holy See notes with satisfaction that the League of Nations has expressly recognized that the question of calendrical reform, particularly because it affects the feast of Easter, is emphatically a religious question, * * and that any alterations, even though they raise no question of dogma, would necessitate a departure from long-established traditions from which it would be neither legitimate nor desirable to depart without grave reasons of universal concern. Moreover, the Holy See finds no sufficient reason to modify the constant tradition of the Church in fixing the ecclesiastical feasts, and particularly the feast of Easter, a tradition handed down from a venerable antiquity, and sanctioned from ancient times by councils. Therefore, if it were shown that the general welfare requires some change in these traditions the Holy See could not examine the question except upon the advice of an Ecumenical Council.

To this the League has made reply that "the common good calls for the stabilization of movable feasts." During a debate in the House of Lords on March 4, 1936, Lord Desborough referred to a mission of inquiry which had visited Rome in the summer of 1935 to inquire more particularly into the attitude of the Vatican. The mission was headed by the Right Rev. Dom Fernand Cabrol, Abbot of Farnborough. They presented to the Pope a memorial on behalf of the Rational Calendar Association and its associate organizations for calendar reform in the United States, France, Germany, Canada, and South America. The mission reported their conclusion "that the subject of calendar reform is viewed by the Vatican as a whole, and the question of Easter stabilization cannot be detached from the question of general reform."

In England the Easter Act was passed in 1928, which provides for the stabilization of Easter by fixing it on the Sunday following the second Saturday in April. Easter would thus fall on a date from April 9 to April 15, whereas the present permissible limits are from March 22 to April 25.

*Translated by the author from the French text given by Abbé Chauve-Bertrand in *La question de Pâques et du Calendrier. Les Œuvres Françaises* (Paris, pp. 213, 214).

**See Church and State Cooperate, P. W. Wilson, page 156.

In the House of Commons on December 20, 1934, the Home Secretary stated, in reply to a question:

> His Majesty's Government, after carefully and sympathetically considering the matter in all its aspects, has decided, in view of the difficulty of securing international agreement, to take no further action at the present time to bring into operation the Easter Act of 1928.

It is thus evident that the Easter Act must be considered as dead, and that the stabilization of Easter can only be brought about as a part of the general reform of the calendar. The ecclesiastical authorities of the Anglican Church and many Protestant Churches in all parts of the world have expressed approval of a general reform, and the Ecumenical Patriarch of the Greek Orthodox Church has also given a qualified assent provided that other nations fall into line.

The inconveniences of the present calendar are so manifest that it is remarkable that it has remained unreformed for so long. Every year the whole almanac is completely changed. Neither the months, the quarters, nor the half-years are comparable with one another. A month may consist of 28, 29, 30 or 31 days. The first quarter of the year contains 90 days, the second quarter 91, and the two last quarters 92 days; one half-year is three days longer than the other. The year is not exactly divisible into weeks; dates, therefore, never fall on the same days from year to year. The same month in different years may contain four Sundays or five. In consecutive months the number of working days always varies. Sometimes there are 52, sometimes 53 pay-days, sometimes two Easters, in the fiscal year, and payments of interest, dividends and rents, and currency of bills of exchange and the term of legal contracts, are greatly complicated by the want of a fixed year. The banks have to use very elaborate special tables in order to make accurate daily calculations in current accounts, and the work of accountants, auditors and Treasury officials is unnecessarily magnified by the universal irregularity.* Accurate statistics are now essential for intelligent social planning; indeed, without them the nature of human society could never become known. In trade and commerce, in meteorology, medicine, sociology and economics, statistics are required, and an increased uniformity in the calculations is desirable.

Moved by these considerations, calendrical reformers desire to establish a perpetual calendar—that is to say, one in which every year begins on the same day, which, it is suggested, shall be Sunday, and in which the same date in every year shall fall on the same day. But the reformers differ as to the best manner in which this may be achieved. They fall into two groups, who may be divided into supporters of a year of equal quar-

* This summary is taken from *Dates and Days*, issued by the Rational Calendar Association, 38 Parliament Street, London, S.W. 1.

ters, and a year of equal months. Under the first of these systems every quarter will consist of 91 days, and every quarter and every half-year will begin on the same day. The first month of every quarter will consist of 31 days, the remaining two of 30 days each. The first day of every year and of every quarter will be Sunday; of the second month in every quarter Wednesday, of the third month Friday. Every month will have 26 week-days. The proposals of those who advocate a year of equal months of 28 days each are more drastic and will necessitate the introduction of an additional month, which it is proposed to insert between June and July—to be called 'Sol.' It will be seen that under both these schemes there are thus accounted for only 364 days in each year; it will thus be necessary to intercalate an extra day at the end of the year. This cannot, of course, be taken out of the solar year, but it will not be part of any week. The special name proposed for this "blank" day is "New Year's Eve" or simply "Year Day." In leap years an additional day, "Leap-Year Day," must also be intercalated, which may most suitably be placed at the end of the half-year to follow June 30.

It is the introduction of these intercalary days which has caused trouble to the Christian Churches as well as to the Jews, because the continuity of the Sunday will be broken—that is to say, there will be at the end of each year a period of eight days before Sabbath or Sunday will occur. The difficulty was felt by the late Cardinal Mercier, who posed two questions to the Holy See. He asked: (1) Whether it were permissible for Catholics to discuss the question of a new basis for the celebration of Easter. (2) Whether the extra days might be introduced into the week. Mgr. Piacenza, writing in the *Ephemerides Liturgicae* (an important Roman review) on July 15, 1918, reports the answer: that such discussion was neither *"per se incongruum neque prohibitum,"* but that the Church did not allow seven days of continuous labor. It is suggested that this objection may be met by reduplicating Saturday—that is, by extending it over 48 hours at the end of the year, and again in the middle of the year in leap years.

The advantages of the first scheme, that of equal quarters, are obvious. It is preferred by astronomers, and also by the Churches because it leads to less interference with the ecclesiastical festivals than the plan of 13 months of equal length. Were it introduced, fixtures will always fall on the same date if the day is fixed and on the same day if the date is fixed. Christmas Day, for example, will always fall on a Monday and August Bank Holiday will always fall on August 6. Quarterly statistics will be exactly comparable when every quarter contains 91 days. Equal quarters will simplify the tasks of accountants and bankers. All anniversaries will fall on the same day of the week. Law, school and university terms will be standardized, railway and other time-tables will be stabilized.

NEW BOOK FROM EUROPE

Reviewed by the Rev. Edward S. Schwegler, D.D.

ALLGEMEINER NEUKALENDER, *von J. B. Achatz*
Neka Verlag, Straubing, 1937

FROM Europe comes another book on calendar reform. The steady stream of books having to do with this question is a constant indication of the fact that the subject has a continued fascination for numberless minds. The present work would seem to have been written by a Catholic, for it bears the *Imprimatur* of the Vicar General of Ratisbon. It is of particular interest because it is a strong, earnest thesis for a scheme that may be new to many advocates of calendar reform: The World Calendar without supplementary days.

But to give first a résumé of the contents. A theoretical, *a priori* discussion on the need of reforming the calendar is followed by succinct chapters on the calendar in general, the lunar calendar, the Julian calendar, the Gregorian Reform. Then comes the demonstration of the author's particular thesis about a World Calendar without supplementary days; and this is the most significant and interesting part of the work. A lengthy concluding chapter gives all the essential facts about our present Easter cycle. A number of tables help to clarify the book.

But what of this World Calendar without supplementary days?

The length of the months would come in the same succession as in the World Calendar: 31, 30, 30 days per quarter, except that the last month of the last quarter (December) would contain 31 days. This would give 91, 91, 91, 92 days in the successive quarters. In leap year the last month of the second quarter (June) would also have 31 days, and then the picture of the calendar by quarters would be 91, 92, 91, 92 days. Each successive year would begin a day later than the previous year (two days later in leap years), so that the proposed "Universal Calendar" could be introduced at any time, and would always start each year anew on the same day as does our present calendar. The days of the week, of course, would vary in date just as they do now.

This arrangement even without the supplementary days of The World Calendar is, of itself, quite attractive and logical, as the author points out in a rather unique way: "The 365 days of the year divided by 12 produce 12 periods of 30 5/12 days each, or 30 whole days. The remaining (12 $\times$ 5/12) 5 days would then quite appropriately be distributed in this fashion: four of the days would be put at the beginning of each quarter and the other day at the end of the last half of the year. Then, quite symmetrically, the extra day of leap year would be assigned to the last month of the first half of the year. . . . Seven months of the year would remain

the same: January, June, July, September, October, November, December; and five would be changed: February, March, April, May, August." But naturally, the immediate criticism one must make of this plan is that the arrangement does not produce an immutable and perpetual calendar. Only supplementary days can do that.

In his eighth chapter, "On Imaginary Calendar Reform Problems," the author attacks the other principal plans of calendar reform. The 13-month scheme and the intercalary week idea he rejects altogether. And The World Calendar he sets aside to the extent that it demands supplementary days.

The argument of the author here is interesting. The impermanence of our calendar, whereby the dates move ahead one or two days each year is, he says, no human device, but a natural phenomenon, even as the varying length of night and day are natural facts that simply must be accepted and cannot be brushed aside. But this is a gratuitous idea that may very properly be denied. The year and the month and the day are based on natural phenomena well enough, but the week certainly is not. The week is an arbitrary time-unit, not a natural one. No event or fact in nature can be used to measure off a period of seven days. The author is on firmer ground when he claims that the seven-day week is of divine origin: but even then the argument falls flat. The Sabbath was also of divine origin: where is it today among the churches of Christendom? It was a matter of positive legislation, not of natural necessity; and it has given way to other and subsequent positive legislation. The same could also happen to the week, at least to such an extent as would make it possible to use the supplementary days now and then.

The very biblical passage quoted by our author shows that the sabbath legislation was not absolute. "Six days shalt thou labor. . . ." Does this mean that men were always to work six days—no more, no less? It could not have had that meaning: the Jews themselves celebrated extra sabbaths in the course of the week that broke up the succession of six work days.

As a point against the fixed calendar with supplementary days, the author brings up the old argument about variety: *varietas delectat.* But the calendar is a means of measurement: and in measuring things there is no room for variety. The ridiculousness of this argument will become apparent if we use the author's very words, but substitute "foot rule" for "calendar": "The movable foot rule (now 11 inches, now 12 inches, for example) is like a living organism; the immovable foot rule (always 12 inches) is like a dead mechanism, like a clock that stands still and does not go. Permanency and immovability are the signs of death. An immovable foot rule therefore does not appear in any way to be a desirable thing." Such rhetoric about a unit of measurement is simply laughable.

Herr Achatz has one very puerile objection to the supplementary day. There would be a great argument, he says, as to whether it would be a

work-day or a holiday. If the former, many would complain that they would have to work one day more than usual in the given week; if the latter, many others would be put out because they would be deprived of a day on which they might otherwise be gainfully employed.

To this one may briefly respond that there has been no question among calendar reformers about the supplementary day being a holiday. This idea has been inherent in The World Calendar from the very beginning. As for the introduction of new holidays, it has been done time and time again in the history of the world. All patriotic days—anniversaries of battles, coronations, constitutions—were new holidays once. Labor Day is a very modern instance of a newly introduced holiday.

One can, however, agree with Herr Achatz that some of the imperfections found in our present calendar are more theoretical than practical. Thus, the fact that September, October, November and December have lost their numerical significance is no reason why they should be restored to a different place among the months. These names now have a seasonal, not a numerical, connotation. Nor is there any need to change the Gregorian leap-year rule. The dropping of a leap-day in a fourth-centurial year every dozen centuries or so will take care of the present slight inaccuracy.

When he deals with the matter of Easter, our author forgets his arguments about variety, and finds that the movability of the Easter date is "abnormal." The movability of the week-days, on the other hand, he finds "normal." Hence, he would fix Easter to within a week by placing it on the fifteenth Sunday of the year, which would confine it to April 8-14. It need hardly be pointed out that, if the present variation of 35 days in the Easter date is an imperfection, the variation of 7 days would still be an imperfection. Aside from this, the author's arguments against retaining the lunar method of reckoning Easter can only be applauded.

This is an interesting and thoughtful work. A perusal of it will almost invariably give even those familiar with the subject some new angles of it. Yet it seems too bad that Herr Achatz does not champion the one plan that would bring to real fruition the proverb which he appeals to:

Harmonie und Ebenmass
Geben schoenstes Zeitenmass

There is no question but that the simplest and most logical solution of all calendar problems is The World Calendar with supplementary days. All writers interested in the subject of calendar reform should hesitate to confuse it by altering The World Calendar or by introducing new ideas and new schemes. The only way in which a real reform of the calendar can be achieved is through the consistent cooperation of all concerned in advocating one, and only one, plan. Anything else merely does harm to the whole movement, divides the forces of reform, and postpones the day when measuring the year will be as simple as measuring a straight line.

TIME THROUGH THE AGES

By ARTHUR M. HARDING

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This is the seventh of a series of articles on the scientific backgrounds of man's system of measuring time. The writer is a distinguished member of the American Mathematical Society, the American Astronomical Society and the American Association for the Advancement of Science. He is the author of the most popular textbook on astronomy which has been published in many years.

ALL nations, both ancient and modern, have allowed the sun and the moon to regulate their calendars and have made use of natural time units—the year, the month, and the day. Another very common unit of time is the week of seven complete days. This unit, however, is not a natural one, having nothing whatever to do with either the sun, the moon or the stars, but has been created by man himself.

The week of seven days was used by many ancient nations but not by all. The Egyptians divided their month into three periods of 10 days each while the Hindus preferred to have only two parts in every month, the light and the dark of the moon. The Chinese divided their months into four weeks of seven days each. The Persians had six periods of five days each, although they later adopted the seven-day week. The Roman people did not use the seven-day week at first and the early Greeks had no week of any kind.

The American Indians measured long periods of time by "winters." They measured their months by "moons" and their days by "sleeps," and the seven-day week was not a part of their calendar. The Japanese used the seven-day week but they seem to have not been under the influence of the early astrologers, for they named the days, not after the seven planets, but after the most important celestial bodies and terrestrial elements; namely, the Sun, the Moon, Fire, Water, Wood, Metal and the Earth.

The Jews seem to have used the seven-day week from the earliest times and it must have originated even before the time of Moses. All early peoples had great respect for the number "seven." There were seven wandering bodies in the sky (planets) and there were seven stars in that compact cluster known as the Pleiades—the cluster that regulated the earliest known calendars and fixed the date of Hallowe'en. Each of the Bears in the northern sky is a constellation of seven stars that was intimately associated with the folk lore of all early races north of the equator. When the necessity arose for a day of rest at regular intervals, what could have been more natural than to have it come every seventh day? The Jews did not name the days of the week as we do, except that the seventh day was the Sabbath—the day of rest and worship. The other days were

known as "the first day of the week," "the second day of the week," etc.

Because of the Jewish influence the Roman people finally adopted the seven-day week, but they followed the astrologers rather than the Jews and named the different days after the seven so-called planets. Although several changes have been made in the Roman calendar from time to time, the seven-day week has come down to us unchanged, and historians are often able to fix uncertain dates by means of this definite time-cycle.

Man in early times believed that the earth was at the center of the universe and that all heavenly bodies were created for his special benefit. As he watched the sky night after night he noticed seven bright objects, which daily changed their positions with reference to fixed stars and must, therefore, have been placed in the sky for some definite purpose.

Each of these objects, which he called "planets" (wanderers), was supposed to be attached to a crystal shell, called a "heaven," and each of the seven heavens rotated about the earth as a center. Since there were seven notes in the musical scale, each of these rotating heavens was supposed to give rise to a different note and the result was the "music of the spheres." We find many references in poetry and even in prose to this heavenly music generated by the seven planets which, beginning with the one nearest the earth, were called Moon, Mercury, Venus, Sun, Mars, Jupiter and Saturn.

The interest in the seven planets soon increased to the point where man began to worship them as gods and to believe that these celestial bodies were interested in his welfare and that each planet in turn protected him from the cradle to the grave. This gave rise to the so-called Seven Ages of Man.

In his infancy a man was supposed to be under the protection of the gentle Moon, and in childhood his guardian was Mercury, the god of mischief. During the period of adolescence he depended upon Venus, the goddess of love, for advice and counsel, and in youth he was protected by the Sun. Throughout his manhood, Mars, the god of war, directed his activities, and during early old age his divinity was no other than Jupiter, king of the gods. When old age came upon him he turned to the disciplinarian time-god, Saturn, for whatever consolation and comfort was available.

The names of the seven days of the week and the order in which they occur have become so much a part of our everyday life that we seldom pause to ask, "Who named and arranged the days?" The answer to this question will be found in the lore of the ancient astrologers, who devoted so much time to the seven so-called planets and the gods after whom they were named that man's interest increased to the point where he began to believe that the destiny of the entire human race was in their hands. Consequently, the worship of all of these gods soon became an established part of the religion of these people.

Instead of meeting for worship only one day out of seven as modern Christians do, they worshipped a different god every day for seven days — there were only seven planets—and then started again at the head of the list. This naturally gave rise to a period of seven days, which had nothing to do with the month or the year, each of which bore the name of the planetary god to whom it was dedicated. This is a satisfactory explanation of the names of the seven days in the week, but why were they not named in the natural order of the distances of the seven planets from the earth? The days of the week in the Roman calendar which has come down to us were named after the planets in the order: Saturn, Sun, Moon, Mars, Mercury, Jupiter and Venus. The natural order, beginning with the planet farthest from the earth, is:

Saturn, Jupiter, Mars, Sun, Venus, Mercury and the Moon. Why this change of order? Here again we recognize the influence of astrology upon the human race.

Early astrologers looked upon the week, not as a period of seven days, but rather as a group of 168 hours. In order that the honor of ruling over and protecting man-

kind might be shared equally by all of the planets, it seems that each one was supposed to remain on duty for only one hour at a time and then be relieved by the next in order, until the entire period of 168 hours had elapsed.

Since the number of hours in a day (24) is not an even multiple of seven it was necessary for the planets to go on duty at different times on different days. Thus the person who wished to pray daily to the goddess Venus was forced to enter her temple at a different hour every day of the week. The planet that ruled during the first hour of any day also had a general influence over the entire day and naturally gave its name to that day.

Let us suppose that Saturn watches over mankind during the first hour of a certain day, which we shall call Saturn's Day. Then Jupiter will serve during the second hour of this day, Mars, the third hour, the Sun the fourth, Venus the fifth, Mercury the sixth, and the Moon the seventh. The seven planets will then run through twice more, Saturn being again on duty during the eighth and fifteenth hours. Saturn will then rule during the 22nd hour, Jupiter the 23rd, and Mars the 24th, completing the day. This will bring the Sun on duty the 25th hour, which will be the first hour of a new day called Sun's day. Venus will then go on duty during the 26th hour and each planet will take its turn, each new day being named after the planet that is on duty during the first hour of that day. It is obvious that the next day after the Sun's Day begins with the 49th hour, when the Moon is on duty. This is Moon's Day.

The next day, Mars' Day, begins with the 73rd hour when Mars is again on duty. Another day is ushered in by the 97th hour, when Mercury happens to be in charge of human affairs. This is Mercury's Day. The next new day begins with the 121st hour, which finds Jupiter on duty and is consequently called Jupiter's Day.

The last day in the group of seven begins with the 145th hour, which is in charge of Venus and is known as Venus' Day. The next day begins with the 169th hour, when Saturn is again on duty. This of course is Saturn's Day—the first day of the next week—and the cycle begins to repeat. Thus the days of the week were named in logical order after the seven so-called planets.

For thousands of years man has been using a time-cycle given to him by the astrologers and consisting of seven days following each other in a given order which may be extended forward or backward indefinitely. Obviously any day may be considered as the first day of a week and the time-cycle ends after the expiration of seven days and a new week begins. However, as far as the human race is concerned, there is one dominant planet—the Sun—which was an object of worship among all primitive peoples. Consequently it was natural for early peoples to consider the Sun's Day (Sunday) as the first day of the week and to have the week end with Saturn's Day (Saturday).

The original home of astrology and the division of the day into 24 hours seems to have been Chaldea, so that it was probably among these peoples that the seven-day week, with the days named after the seven planets, originated. The ancient Hebrews did not divide their day into 24 hours, nor worship the seven planets.

It is obvious from a study of ancient Hebrew literature that the Jews made constant use of the seven-day week, which they probably obtained from the four phases of the moon. The fact that the writer of the first chapter of Genesis used the seven-day week as a frame upon which to hang the story of creation is good evidence of this fact. With the exception of the Sabbath, the day on which man and beast rested from his labors, the days of the week were merely numbered and not named. The Sabbath was celebrated on the seventh day—Saturday—according to the Mosaic law.

How many of us, who so regulate our affairs that we can work for six days and then rest on the seventh, realize that the names of the days of the week resulted from the practice of astrology? One cannot help but wonder what kind of a week we would now have if the astrologers had only known that there were nine planets and that the correct list does not include either the Sun or the Moon. We might now be using a nine-day week without Sunday and Monday but including Earthday, Uranusday, Neptuneday, and Plutoday.

The early Fathers of the Church adopted the Jewish custom of numbering,

rather than naming, the days of the week—except the Lord's Day and the Sabbath—but in spite of this opposition the pagan names were retained by western peoples. In the East, however, this custom is not so general for among the modern Greeks and the Japanese the days of the week are not named after the planets.

It may be of interest to insert here for reference the names of the days of the week in several languages. In most cases the derivation of these names is obvious, but the identification of Tuesday, Wednesday, Thursday and Friday with Mars, Mercury, Jupiter (Jove) and Venus is not immediately evident.

Latin	*French*	*Spanish*	*Italian*	*German*	*Anglo-Saxon*	*English*
Dies Solis	Dimanche	Domingo	Domenica	Sonntag	Sunnan-daeg	Sunday
Dies Lunae	Lundi	Lunes	Lunedi	Montag	Monan-daeg	Monday
Dies Martis	Mardi	Martes	Martedi	Dienstag	Tiwes-daeg	Tuesday
Dies Mercurii	Mercredi	Miercoles	Mercoledi	Mitwoch	Wodnes-daeg	Wednesday
Dies Jovis	Jeudi	Jueves	Giovedi	Donnerstag	Thunres-daeg	Thursday
Dies Veneris	Vendredi	Viernes	Venerdi	Freitag	Frig-daeg	Friday
Dies Saturni	Samedi	Sabado	Sabato	Samstag	Saetern-daeg	Saturday

The word for Sunday in French, Spanish and Italian means "Lord's Day," but in the other languages shown above it is simply "sun's day". Monday is in every case "moon's day". Each of the seven names for Tuesday means "Mars' day", our English word being derived from Tuesco, the Scandinavian war-god corresponding to the Roman Mars and the Anglo-Saxon and German words from Tiu, Babylonian war-god.

The Norse god corresponding to the swift moving Mercury was Woden, god of the Wind (called Odin in England) and from Woden's day we have derived Wednesday. The German Mitwoch means merely "mid-week". The Scandinavian god Thor was supposed to carry a remarkable hammer that would return to his hand after being thrown into space. It was the angry god Thor who caused lightning to flash and thunder to roar by throwing his hammer at the terrified inhabitants of the earth. Among the Romans it was Jupiter who hurled the thunderbolts so that Thor's day (Thursday) is the same as Jupiter's day. Both the German Donnerstag and the Anglo-Saxon Thurnes-daeg mean "thunder-day".

Friga was the Scandinavian Goddess of Love corresponding to the Roman Venus. Thus we have Friga's day (Friday) instead of Venus' Day. In Latin, Anglo-Saxon and English the word for Saturday is "Saturn's day," but in the other languages it means "sabbath day".

From very earliest times Friday, being named for the goddess of love and beauty, was a lucky day and a favorite day for weddings. But for some reason Friday has lost its "charm" and is now considered the most unlucky of all days of the week. Christians may have gotten this idea from the fact that Christ was crucified on a Friday, but Buddhists and Brahmins, who also look upon Friday as an unlucky day, certainly did not get this idea from the crucifixion of Christ. The origin of this superstitious belief, like most others, is lost in the dim, distant past.

If there is any such thing as a lucky day of the week, this day should be Friday as far as Americans are concerned. Was it not on a Friday that Columbus first landed on American soil? Did not the Pilgrim Fathers land at Plymouth Rock on a Friday? Was not George Washington born on a Friday? Was it not on a Friday that Cornwallis surrendered at Yorktown? Surely Friday has been a lucky day in the history of America.

All Fridays are looked upon with disfavor and if the 13th of the month happens to come on Friday this day is very apt to bring ill luck. Even in the 20th Century it is quite impossible to live through any Friday that happens to coincide with the 13th of the month without hearing several

references to this fact. This is not due to the rarity of the combination of Friday and the 13th of the month, but rather to the superstitious belief that this is the unluckiest of all Fridays.

As a matter of fact, Friday the 13th is by no means a curiosity, for the 13th of the month actually occurs on Friday more often than on any other day of the week. Our calendar repeats every 400 years and in this cycle the 13th falls on Friday 688 times, on Sunday and on Wednesday 687 times each, on Monday and Tuesday 685 times each, and on Thursday and Saturday 684 times each. When we live under the perpetual World Calendar, Friday the 13th will occur four times every year—in January, April, July and October.

Not only was the sacred number seven of such importance as to result in the adoption by primitive peoples of the seven-day week, but no myth or legend was complete without some reference to this mystic number.

Jupiter, king of the gods, had seven wives, and immediately after the birth of Apollo seven swans circled seven times around the island upon which the sun-god was born. Seven cities claimed to have been the birthplace of the blind poet, Homer, and no history of early Greece is complete without some reference to the Seven Wise Men, although different writers name different men. Rome on its seven hills, Constantinople with its seven towers and Thebes with its seven gates, which withstood a seven-year siege by seven generals, occupied the center of the stage at certain periods of the world's history.

Chaldeans, Persians and Arabians were under the protection of Seven Superior Angels; the souls of the sun-worshippers must pass through the Seven Gates of Mithra, and the Indians had their Seven Worlds of Purification. We learn from the New Testament that there were seven churches in Asia and even today there are seven Bibles which are supposed to protect us from the Seven Deadly Sins and to insure that we shall have the Seven Cardinal Virtues. There are Seven Gifts of the Holy Spirit, Seven Sacraments, Seven Penitential Psalms and Seven Great Hymns.

We are all acquainted with the Christian legend about the Seven Sleepers of Ephesus, which is also found in the Koran. We have heard of the Seven Bishops, the Seven Champions of Christendom, the Seven Conspirators, the Seven Ages of Man, and the Seven Lamps of Architecture. We have all marveled at the Seven Wonders of the ancient world, which included the Pyramids of Egypt, the Hanging Gardens at Babylon, the Statue of Jupiter at Olympia, the Temple of Diana at Ephesus, the Mausoleum at Halicarnassus, the Colossus of Rhodes and the Lighthouse at Alexandria, and we are amazed at the Seven Wonders of the modern world—wireless, telegraph, telephone, flying machine, radium, antiseptics and antitoxins, the X-ray and spectrum analysis.

EXCERPTS AND REVIEWS

Food for Thought

By JOHN BOVENKERK

Pastor, Muskegon, Mich.

THERE lies before me on my desk a book recently published in London and New York, which presents the results of years of research in a most charming manner. It is the *Romance of the Calendar*, by P. W. Wilson.

I have read it. I shall read it again, particularly the chapters that deal with the Gregorian calendar and its many imperfections and the chapters on the new World Calendar now proposed and seriously considered for adoption. It constitutes a most valuable adjunct to the *Journal of Calendar Reform* periodically published by The World Calendar Association. It is a dramatic, swift-moving piece of scholarship that will materially aid in the cause of calendar reform. It is a book on the calendar that the layman can read—and it should do a great deal to arouse the public from its lethargy.

In this matter of calendar reform all the nations and religions of the world are involved. The calendar plays an important part in commerce and business, but also in the customs and usages of the various religions. Christianity and the Christian Church cannot sidestep the issue. All this is self-evident. Beyond controversy, there are greater things that require our prayerful consideration, things of vital and primary importance; however, it should not surprise the constituency of our Reformed Church that the General Synod considered seriously the recommendations of its Committee on Resolutions on calendar reform and appointed a committee of four to study its merits and to report at the next session.

Meanwhile Mr. Wilson's book is at our disposal. It is a history of the subject, but it reads like a detective story. In a fascinating manner the author pictures the development of the calendar from times of remotest antiquity and among peoples of every race up to the present world-wide movement of calendar reform. He interests his readers in the battle that raged between the sun and the moon for pre-eminence, ending in the triumph of the solar year over the lunar month. He recalls how men have reformed the calendar more than once—how, for example, Mohammed ordained a calendar for Islam and Omar Khayyam changed the Persian year; how Julius Ceasar promulgated the Julian calendar and Pope Gregory XIII established the Gregorian calendar, used by the Western World for the last three centuries. Mr. Wilson touches upon the very difficult question of the date of the birth of Jesus, and, of course, on the controversy concerning Easter, the Paschal moon, the concept of the Zodiac with its 12 signs in accord with the 360 degrees of the celestial sphere, the attempt by adding Leap Year's extra day to make up for the annual loss of time, and many other problems, too many to mention.

Our Wandering Easter

By JOSEPH JUMEL

Paris *Midi*

AMONG vacation dates which in some way stand out in the minds of all French people, the feast of Easter particularly attracts attention. Does it not mark for everyone the longed-for moment of Spring's beginning and the promise of lighter and milder days, and the first contact of Parisians with the country?

This Easter date is particularly and annoyingly mobile. It was placed for 1938 on April 17—twenty days later than in 1937. Easter's wanderings make us think again of the world's need for a newer and better calendar. The present one was last modified by Pope Gregory in 1582. It's time for another improvement.

I would not say that the question preoccupies many of us. We have other cares. But there are certain important personages who realize its importance and pursue an international attempt to have the calendar changed.

The League of Nations has been studying calendar reform for several years. Last year it brought its conclusions to the point of definite recommendations, which

were communicated to member nations.

Exactly what the proposed changes in the calendar mean, is best told in the words of Abbé Chauve-Bertrand, leading Catholic authority on the subject: "The project recommended by the League of Nations equalizes a little better the 12 months, groups them by threes and giving to the calendar four quarters of 91 days each. Under the new calendar, January 1 would always be a Sunday, the last day of each quarter always a Saturday."

This redistribution of time during the course of a year will do away with the caprice which is now present in the fixation of feast days and all the complications that result from the irregularities of the present arrangement.

The proposed reform has interested the French Chamber of Commerce, and also the International Chamber of Commerce. The Holy See has not remained indifferent, and Abbé Chauve-Bertrand assures us that Rome follows it with the greatest attention, "but will pronounce on it only when almost a unanimity, or at least an important majority, has affirmed support of the plan."

The question is on the order of the day.

Support from India

By V. S. Bendrey, Poona

HOW will India receive the World Calendar? Well, she certainly has no objection either to the change in the various constants of the Gregorian year, or to the shift of the leap-year days, or to the exclusion of the leap-days and the last days of the year from the monthly system of the new calendar.

There has been some discussion, however, on the idea of breaking the continuity of the week-cycle. This particular aspect divides her into four groups:

1. The lot of Christians in India is cast with their co-religionists outside the country and they will follow the dictates of their religious heads in Europe.

2. The followers of the Persian calendrical system, with its special month-day-denominational system, remain unaffected.

3. The Moslem feasts and festivals are determined exclusively on their own lunar calendrical system and depend on the visibility of the moon. Their practice of associating Friday with their weekly prayers may create some reluctance, but Moslems attach no significance to Friday either from the point of view that Venus rules the commencement of that day or from any other serious sentimental or religious ground.

4. The fourth group, which is a very large majority, follows the Hindu calendrical system and believes in the influences of the seven planets on the respective week-days. This group is asked to accommodate themselves to a change which interrupts their sentimental observation of fasts, feasts, festivals and other usages. They maintain (a) that each week-day has the influence of its ruling planet with certain deities connected therewith; (b) that feasts and festivals are being determined on the time of conjunction of a particular week-day with a particular day of the month; (c) that certain week-days are observed as fasting days, irrespective of their position in the calendrical system, chiefly for the influence of their ruling planets and deities over the continuous week-cycle; (d) that astrology, with the aid of which the religious and social ceremonies are fixed, has its tables and formulas complicated with the different values attached to the week-days, and (e) that the importance of Sunday as a holiday, for which the week-cycle has been linked up with The World Calendar, is not important.

The Gregorian calendar is used in India generally and mainly for business and official purposes, but its use is hardly made in conjunction with the week-days.

In the particular circumstances of India, and because of the complications likely to arise in the daily social and religious life of the people, it may be quite simple and practicable to adopt The World Calendar without the week-day system, determining weekly holidays by dates. This is particularly feasible because neither of the three main groups attaches any importance to Sunday as a holiday with the special significance given to it in the Christian world.

India cannot afford to lose the various economic and other benefits which The World Calendar is bound to bring with it. Undoubtedly, she will keep pace with the rest of the world in this matter.

CURRENT PRESS COMMENT

Time to Revise

Allentown (Pa.) Call

We all like to have the things about us, that we use, so made or arranged that they match, fit, are correct and harmonious. We would not like to wear a coat with one sleeve shorter than the other. We would protest if the builder should put into our new house windows that were several inches out of plumb. We are annoyed if the lot line of our property has curves or angles instead of running straight. We require four quarters in a dollar instead of three quarters and a 20-cent piece. One would be justified in annoyance if he were obliged to follow a system that made necessary a change in the number of steps at the entrance of his residence at various periods during the year.

Yet we have gone on year after year without trying to rid ourselves of similar inaccuracies and annoyances in such an intimate and constant companion as the calendar.

Autumnal Equinox

New York Times

At 12 o'clock noon, on September 23, 1938, Eastern Standard Time, the sun, in its apparent southward migration through the sky, stood exactly over the equator, dividing day and night into exactly 12 hours each. This meant of course, that the Autumnal equinox, or "equal night," came this year at exactly noon.

This, according to the United States Naval Observatory, in Washington, is a very rare occurrence, for seasonal changes such as equinoxes do not generally come on an even hour, let alone at the moment that divides the day into two equal parts.

Time's History

Christian Science Monitor

In New York a novel review of the History of Time has just been presented in exhibit form at the Hayden Planetarium. Covering a period of several hundred years are rare and unusual almanacs and calendars representing all parts of the world.

To follow the calendar around the year and down through the centuries is a most exciting adventure. Savages and savants, catastrophes and Caesars, revolutions and religions have all left their mark upon it. As The World Calendar Association has often pointed out, the system of reckoning days and months that hangs on our walls today is a heterogeneous collection of inaccuracies, but it is the best calendar the whole Christian world has yet been able to agree on.

Meeting Modern Needs

Montana Woman

The object of calendar reform is to remove needless complications and to simplify, regularize and stabilize our time system, so that it will adequately meet our modern conditions. The reform must respond impartially to the needs of industry, government, agriculture, science, religion, social life, education and all other phases of activity.

No part of our human existence is free of the calendar—we are inexorably bound to it. All this has been the subject of international conference and study. And it is now generally agreed that the most satisfactory and simple plan of revision is that known as The World Calendar.

Old But Illogical

Amsterdam Het Vaterland

Our calendar has reached a venerable age, but it is not logical in any respect. The new calendar proposed by The World Calendar Association, has adherents all over the world. In Germany a broad study of it has been initiated by the Department of Interior. In China a petition on its behalf was sent to the government with the signatures of 100,000 people.

The draft agreement or treaty, which was introduced into the League of Nations by Chile, was an effort to move forward toward the enactment of this plan of calendar reform. Nations were urged to give official consent to the inauguration of the new calendar on some date to be fixed by the League of Nations.

Will this proposal now have more success than on previous occasions? We must wait and see.

JOURNAL OF CALENDAR REFORM

EDITORS

CHARLES D. MORRIS CHARLES C. SUTTER

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ELISABETH ACHELIS, *President*

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SIX new names make their appearance on the Advisory Committees of The World Calendar Association, as printed on Page 175 of this issue. The American Advisory Committee now includes 14 individuals, while the Foreign Advisory Committee has reached a total of 17 persons, representing 15 different countries.

The six new names include representatives of Education, Diplomacy and the Churches. Education is represented by Dr. Mary E. Woolley, for 36 years President of Mount Holyoke College, a member of the American delegation to the Conference on Reduction and Limitation of Armaments at Geneva in 1936. Diplomacy takes a place on the American Advisory Committee through the Honorable Dave H. Morris, former United States Ambassador to Belgium. Mr. Morris has many progressive interests, and he has for many years advocated a universal language.

For the Churches comes first His Excellency, the Most Reverend Leopoldo Ruiz y Flores, Archbishop of Morelia, Mexico. He is Primate of Mexico and a Roman Catholic leader of long and distinguished service. The Right Rev. Ernest M. Stires is the Episcopal Bishop of Long Island, and a co-worker with Bishop Manning at the Atlantic City Convention in 1934 in obtaining a resolution for a fixed Easter in The World Calendar. Rabbi Martin M. Weitz is a distinguished Jewish writer and lecturer who has just returned from a transcontinental lecture trip of nearly three months, devoted mainly to discussions of calendar reform in college and university forums. The Rev. William Adams Brown, President of the American Section of the Universal Christian Council, is a Professor at the Union Theological Seminary and has the respect of many churches outside his Presbyterian fold.

FROM THE MAIL BAG

Besides the great advantage afforded by the new calendar in every order, I think it is a step for promoting a sane cosmopolitan union between all the nations of the world.—H. E. The Most Rev. Leopoldo Ruiz y Flores, Archbishop of Morelia, Mexico.

As President of the Astronomical Society, I propose to devote an evening to the subject at the Society, and interest my university students in the matter.—R. W. Chapman, Burnside, Australia.

I am much interested in some workable and acceptable system of calendar reform.—C. W. Pugsley, President, South Dakota State College.

Heartily in sympathy with The World Calendar movement. In our own corporation, due to the present faulty calendar, it is necessary for us to set up our accounting on the basis of 13 four-week periods and then, of course, at the end of every fiscal year, some corrections must be made which are annoying. Undoubtedly, the world at large will be improved if The World Calendar is adopted.—H. E. Kiefer, Ware Shoals Mfg. Co., Ware Shoals, S. C.

Your Journal and other material on calendar reform make excellent research material for English and history classes, and possess wonderful culture values.—P. J. Kleinschrodt, Teacher, Sterling, Ill.

As President of this corporation, I will be very glad to submit the modification of the calendar to the Board of Directors of this organization at its next meeting.—J. de Quadras, President of the "Fomento del Trabajo Nacional," Barcelona.

I have been interested in calendar reform for a number of years and have made many addresses on its behalf.—I. N. McCash, Pres., Phillips Univ., Enid, Okla.

Reform of the calendar so that the week-days would always have the same numerical order in the month would be of great value to future historians. To be able to know that an event of April 2 in some past year fell upon Monday would help a scholar to relate it to preliminaries which took place on March 31. His imagination would properly suggest a conjecture of an intervening Sunday. The reforms proposed are of small inconvenience compared with those which marked the change in the 16th Century to the Gregorian calendar. England's reluctance to comply for nearly two centuries has greatly confused historians. In my judgment, however, any change should preserve the 12-month scheme.—D. R. Fox, Pres., Union College, Schenectady.

This World Calendar is such a commonsense arrangement it should be adopted the world over.—Charles S. Walton, Jr., Executive, Philadelphia.

There are many readers of your Journal ready and anxious to help. But we are not content to wait until 1950; we want calendar reform now.—C. C. Caldwell, Atty., Sioux Falls, S. D.

Your organization is performing a much-needed and timely service in exposing the vagaries of the current calendar.—Prof. E. G. Mears, Stanford Univ.

I am whole-heartedly in favor of the 12-month calendar advocated by you. I hope that it will soon be universally adopted. The *Journal of Calendar Reform* is informative and interesting, and much of it is really literature.—H. K. Wagner, Attorney, St. Louis, Mo.

Approve heartily of the Reformed Calendar you are advocating. Colleges and universities as a class will benefit greatly by it. They should be most actively solicited for support.—E. E. Rall, Pres., North Central College, Naperville, Ill.

Simplification represents progress, I heartily endorse the 12-month equal-quarter calendar.—Dr. A. R. Bacon, Chicago.

I believe that only the new 12-month calendar as proposed in your pamphlet has any ghost of a chance of being accepted, since it is less likely to collide with the general inertia against a change from things as they are.—W. Sherwood Fox, Pres., Univ. of Western Ontario.

Calendar reform will be a blessing to educational institutions.—Sister J. Aloysius, Pres., Fontbonne College, St. Louis.

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CUBA: Comité Cubano del Calendario Mundial, R. P. Mariano Gutierrez Lanza, Chairman, Belén Observatory, Havana.

DOMINICAN REPUBLIC: Comité Dominicano del Calendario Mundial. H. E., The Most Reverend Riccardo Pittini, S.C., Archbishop of Santo Domingo, Chairman, Ciudad Trujillo.

ECUADOR: Comité Ecuatoriano del Calendario Mundial. Dr. Rafael H. Elizalde, Chairman, Calle Cienfuegos 158, Santiago, Chile.

ENGLAND: Rational Calendar Association, C. David Stelling, Director, 38, Parliament Street, London.

FRANCE: Comité National pour la Reforme du Calendrier, Senateur Justin Godart, Président, Paul-Louis Hervier, Secy., 5, Rue Bernoulli, Paris.

GERMANY: Deutscher Ausschuss für Kalenderreform. Dr. R. Reichard, Chairman, Ministry of Interior, Berlin—Der Weltbund für Kalenderreform. Dr. Rudolph Blochmann, Secy., 24 Lornsenstrasse, Kiel.

GREECE: Greek National Committee on Calendar Reform, Prof. S. Plakidis, Secy., Observatory of University of Athens, Athens.

HUNGARY: Hungarian Committee for Study of Calendar Reform. Dr. Paul Vajda, Secy., 9 Eotos Utca, Budapest.

IRELAND: Committee for Calendar Reform, E. K. Eason, Secy., 80, Mid. Abbey St., Dublin.

ITALY: Italian National Committee on Calendar Reform, Prof. Amedeo Giannini, Secy., Via del Seminario, 113, Rome.

MEXICO: Comite Mejicano del Calendario Mundial, Don Joaquin Gallo, Chairman, Observatorio Astronomico Nacional, Tacubaya, D. F.

PANAMA: Comite Panameno del Calendario Mundial, Don Octavio Mendez Pereira, Chairman, University of Panama, Panama.

PERU: Comite Peruano del Calendario Mundial, Don Luis Montero y Tirado, Chairman, Casilla 220, Lima.

SOUTH AMERICA: Comite Latino-Americano del Calendario Mundial, Dr. I. Gajardo Reyes, President, Calle Castro 214, Santiago, Chile. This committee directs the activities of national organizations in Argentina, Brazil, Costa Rica, Mexico, Uruguay, Chile, Peru, Venezuela, Bolivia, Cuba, Ecuador, Colombia, Dominican Republic and Panama. The honorary presidents of the committee are Dr. L. S. Rowe, Director-General of the Pan American Union, and H. E. Dr. Alfredo de Castro.

SPAIN: Spanish Calendar Reform Committee, Father Luis Rodes, S. J., Chairman, Ebro Observatorio, Tortosa.

SWITZERLAND: Swiss National Committee on Calendar Reform, Prof. Emile Marchand, Secy., Mythenstrasse 2, Zurich 2. —Comité International de Coopération de l'Association Universelle du Calendrier, M. Raymond Mage, Secrétaire Général, Palais Wilson, Geneva.

TURKEY: Committee on Calendar Reform, Prof. Ihsan Ali, Secy., Ayas Pasa Nimet Apt. 3, Istanbul.

URUGUAY: Comite Uruguayo del Calendario Mundial (Igualmente del Paraguay), Prof. Alberto Reyes Thevenet, Chairman, Liceo de Ensenanza Secundaria Hector Miranda, Calle Sierra 2268, Montevideo.

VENEZUELA: Comite Venezolano del Calendario Mundial, Senora Maria Luisa Escobar, Chairman, Avenida Este, N. 43, Caracas.

EDITORIAL PARAGRAPHS

A universal change in the calendar would meet the approval of all nations and religious bodies.—Chicago *News.*

If the scientists can make The World Calendar a fact, they will have accomplished a great deal.— St. Louis *Post Dispatch.*

This plan has many advantages. It will facilitate statistical comparisons, coordinate different time periods and stabilize religious and secular holidays.—San Francisco *Chronicle.*

Aside from improving time calculation, adoption of calendar reform would renew hopes of world unity and symbolize the dawn of a new day.—Cincinnati *Enquirer.*

The World Calendar corrects the inaccuracies inherent in the present system.—Chicago *American.*

Chief obstacle to adoption of calendar reform is the inertia of the mass of mankind.—Dublin (Ireland) *Mail.*

There has been more real study of the subject of calendar reform by leaders of the Roman Catholic Church than by any other group.—Cork (Ireland) *Examiner.*

Women's clubs have chosen an interesting theme in questioning whether the present calendar is functioning on the square with us, and whether we are living on the square with the calendar.—Lockport (N. Y.) *Journal.*

The subject of calendar reform should be of particular interest to schools.—Toronto *Progress.*

A motive for churches to press for calendar reform is to give Easter a fixed position—a change that no one seriously contemplates until the calendar changes that the business world and professional men request shall be made internationally. —Utica (N. Y.) *Observer Dispatch.*

It is a fact that the Roman Catholic Church was the first to propose the calendar reform plan which has recently been approved by the League of Nations. It was suggested in 1835 by an Italian priest, the Abbé Mastrofini.—London (England) *Inquirer.*

Certainly things would be a great deal simpler for a vast number of people if the calendar were perpetual. — Belfast (Ireland) *Telegraph.*

It is a fitting time to consider the calendar and how its correction by the scientific knowledge of this age would improve our Christian usage of it.—*Holy Cross Magazine.*

With progress in business methods and with changing world economy, there has arisen a distinct need for better tabulation of days, weeks and months.—Denver *Deco-Trefoil.*

Because in modern times calendar irregularities have become very troublesome, a revised calendar is now before the public for study. The plan known as The World Calendar is approved by many governments and religious bodies. It is full of interest for all students.—Baltimore *Johns Hopkins Magazine.*

So influential a farm organization as the National Grange speaks a good word for calendar reform. The World Calendar Association may be congratulated on having won over so eminent a recruit.—San Antonio *News.*

Advocates of this simplified calendar are trying to make our calendar so easy that a child can memorize it in a few minutes.—Taylorsville (Ill.) *Breeze.*

Astronomers have been advocating this revision of the calendar for generations. —Atlanta *Constitution.*

It is certainly desirable to correct the calendar. And the job can be done with so little disturbance that it will hardly be noticed.—Allentown (Pa.) *Call.*

If our present calendar can be improved without violent changes which would cause confusion, it seems evident that the improvement would be a good thing.— Fremont (Neb.) *Tribune.*

The powerful movement to bring the calendar closer to nature is one world question on which governments, scientists and churches can agree. — Hollywood (Calif.) *Health News.*

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DECEMBER, 1938

JOURNAL OF CALENDAR REFORM

CONTENTS

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New York City

CALENDAR FOR THE YEAR 1939

In 1939 both the old and the proposed new calendars begin the year with Sunday, January 1st, with the following significant differences.

OLD GREGORIAN CALENDAR

FIRST QUARTER

	S	M	T	W	T	F	S
JAN	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
FEB				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28				
MAR				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	

90 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL							1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31					
AUG			1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31		
SEP						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

92 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR							1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30						
MAY		1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			
JUN					1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
NOV				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30		
DEC						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31						

92 days

This calendar has 52 weeks and must borrow one day from another week to complete the year. This causes the calendar to change every year and is responsible for its confusion. Also note varying number of days in each quarter.

NEW WORLD CALENDAR

FIRST QUARTER

	S	M	T	W	T	F	S
JAN	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
FEB				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30		
MAR						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL	1	2	3	4	5	6	7
	8	9	10	11	12	13*	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
AUG				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30		
SEP						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

91 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
MAY				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30		
JUN						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
							**

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
NOV				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30		
DEC						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
							*

91 days

*YEAR-END DAY. December Y or 31, an extra Saturday, follows December 30th every year.
**LEAP-YEAR DAY. June L or 31, another extra Saturday, follows June 30th in leap years.

EACH YEAR DIFFERENT

This calendar is always different from year to year.

The quarters are unequal in length.

Each quarter begins and ends on a different day of the week. Each month begins and ends on a different weekday.

The months have a varying number of weekdays.

Each year begins on a different weekday.

This old calendar is unbalanced, unstable and irregular in arrangement.

SOON YOU WILL BE DISCARDING THIS OBSOLETE CALENDAR.

EACH YEAR THE SAME

This calendar bears no year-date and is good for every year.

The quarters are equal in length.

Each quarter contains 3 months—13 weeks—91 days—begins on Sunday and ends with Saturday.

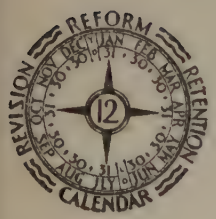
Each month has 26 weekdays—plus Sundays.

Each year begins on Sunday.

This revised calendar is balanced in structure, perpetual in form, harmonious in arrangement.

SOON YOU WILL BE USING THIS UP-TO-DATE CALENDAR.

JOURNAL
OF
CALENDAR REFORM



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CHARLES D. MORRIS CHARLES C. SUTTER

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!!! GREETINGS !!!

By GEORGE KENT

Formerly Director of Public Information of the League of Nations Association

ONE hundred years ago, a Scotsman of Leith named Thomas Shorrock sent a card to his friends reading, "A Gude New Year to Ye." This was the first Christmas card. The idea caught on to such an extent that between 1862 and 1894 one Jonathan King was able to exhibit a 700-volume collection of cards that weighed between seven and eight tons.

Last year, Americans alone sent nearly one billion greeting cards. As a matter of record, they spent for them $60,000,000 and another $10,000,000 for stamps to speed them through the mails.

Christmas and New Year's, of course, accounted for most of them, but hardly a day out of the 365 went by that did not witness a greeting card of some kind riding in the postmen's pouches. Easter, Valentine's Day, and Mother's Day were next to the Yule festival in volume of mailings. Not only were there printed sentiments for all the national holidays but also cards for state and local festivals, for Orangemen's Day and the day devoted to St. Swithin, for dates sacred to fraternal orders, for birthdays and other anniversaries significant to individuals.

We have here an important industry—capitalized at about $500,000,000—one involved in a picturesque and practical way with the calendar. To the 50 publishers of greeting cards, *dates* are bread and butter and in some cases, great wealth. The year for them is a procession, literally, of red-letter days. Any change in the method of reckoning time is of immedi-

ate concern to them, and a reform that will simplify and regularize the system, is a matter of prime economic importance. I have discussed the question with leaders in the industry and I am here stating the consensus of opinion.

To begin with, they are publishers in much the same category as those who issue magazines, and like them they have their periods of preparation, their deadlines, their dates of publication, except that in the greeting card industry, they are more numerous, more irregularly distributed.

The line of Christmas cards, for example, is being made ready almost a year before the holiday season begins for you and me and the shopkeepers. The date the work starts is January 10th, immediately after the Christmas-New Year's season ends.

Thousands of designs and sentiments must be prepared, millions of dollars invested. Paper by the ton from American and foreign mills requires purchasing. Ribbon, tinsel, lace and even sachets must be laid in stock. Artists in every mode, from painters in oil to caricaturists, are given work to do, and a staff of writers in verse and prose begin grinding out sentiments lyrical, satirical and gooey. Several thousand amateur poets seize the opportunity to flood the publishing offices with verses which, if accepted, will be paid for at 50 cents a line.

In July, while the nation swelters, salesmen in palm beach suits tour the country selling cards depicting snow scenes, reindeer and holly.

What the industry does for the year-end line of cards, it does to a lesser degree for all the other annual festivals. May, for instance, is the peak of the graduation rush; June, the wedding season; July and August, the travel months, etc.

An unbelievable amount of labor and of intricate planning is involved. The year for the industry has become organized into a time-table involving for most publishers 20 major dates and as many minor ones. And for each date, there are at least two others concerned with production and sales schedules. It is apparent that the calendar is for these manufacturers more than a simple desk convenience.

The members of the industry with whom I discussed the matter agreed that a regularization of the days, weeks and months, such as contemplated by The World Calendar, would be highly acceptable. The assurance that holiday dates would be fixed and immutable would be an improvement to their liking. Schedules could be simplified and rendered easier not only for the manufacturers themselves but for the jobbers and their retail outlets—the gift shops, bookstores, and the five and ten cent chains.

The permanent linking of the weekday with the month date, that would become possible under the reformed calendar, would also be a factor of great utility in the manufacture of greeting cards. The name of the weekday, now unimportant, would become an important part of anniversary

salutations, and its invariable association with the date would undoubtedly lead to a new type of greeting card.

Birthday greetings account for a good proportion of the total number of cards sent. Many dealers in this type of greeting send to their customers calendars on which they are requested to mark the days on which they want to remember friends and relatives. The dealers undertake either to remind them a day or two in advance of the occasion or to take care of the dispatch of the cards chosen.

Finally, the members of the industry would profit along with other business men in being able to keep their records more accurately and so be in a position to make more precise comparisons of production, sales, costs and income, from year to year. This is especially important to a group of manufacturers whose year is divided into 10 to 30 "seasons."

Mr. A. A. Versh, executive of the American Artists Group, considered the idea embodied in The World Calendar a singularly happy one. The company he is connected with is a newcomer in the field but one of unusual force. It inaugurated three years ago the practice of getting famous modern artists to draw or paint or etch cards for distribution on a royalty basis. They were given the privilege of using their imaginations and so have produced designs of striking originality. Rockwell Kent, Doris Lee, Ernest Fiene, and others are represented.

"The World Calendar is a fine idea and a very helpful one," said Mr. Versh. "It will be very useful to our group, even though we confine our production to the Christmas season, and so do not have the complicated schedules and distribution systems of those who cover all the holidays and special greeting card occasions."

Mr. R. C. Silverman of the Paramount Greeting Card Company also gave his hearty approval. To him the association of the weekday with the date suggested excellent possibilities, and he felt sure the fixed calendar would be genuinely useful to his industry in a great many ways.

Other publishers expressed themselves in similar vein, as did also a number of publishers of calendars. The World Calendar, they pointed out, would present an opportunity to produce more permanent time-counting devices—calendars—that could be sold for a higher price and so be made of more costly materials. They would become household and office fixtures, far more than they are today—as fixed as a clock, as changeless and perhaps as ornamental as a sun-dial. Calendars could be built into the walls of a house or integrated into the design of room, table or desk.

On the artistic value of permanent calendars, we can quote no greater authority than Mr. Levon West, eminent American etcher, who said, "I can imagine bronze plaques of this perpetual calendar, made by the best medal or coin designers of the world, hanging over or standing on my desk. These could be made either to embrace the entire year or could be

made in sets of twelve, month by month, to be repeated year after year.

"As an etcher I can imagine making a set myself. Fine lines and soft shading on fine paper, a small calendar in the center, a wide border with mythological figures, pure ornament, or something illustrative of the season. I can imagine a permanent calendar, cut in stone, in a college auditorium or a public hall. I can imagine one in the form of a mural painting."

From the greeting card industry generally, there is nothing but interest in and welcome for the reform in the calendar. They have become accustomed to the present irregular method of reckoning the march of the days in the same way a man who sprains his ankle becomes used to a crutch. The convenience of the new calendar is so great that I doubt whether any of these publishers, for all their approval, fully appreciate how much it will mean for them.

It will give them, for one, a new holiday each four years in Leap-Year Day, and by its organization render easier the setting aside of other days as dates to be remembered and celebrated.

AMERICAN OFFICIAL OPINION

(From Recent Reports to The World Calendar Association)

As an agency of the Government that necessarily utilizes data on a large scale, the Works Progress Administration naturally is interested in the calendar reform movement. General adoption of a standardized calendar would undoubtedly simplify certain of the statistical and administrative aspects of our work.—Emerson Ross, Director, Division of Statistics and Economic Research, Works Progress Administration.

We are in accord with your objective as stated: "We advocate the retention of the twelve-month calendar, revised and reformed to meet modern requirements."—Donald S. Thompson, Chief, Division of Research and Statistics, Federal Deposit Insurance Corporation.

Having been interested in the subject for many years, I am glad to see the progress that is being made.—John H. Fahey, Chairman, Federal Home Loan Bank Board.

We are, of course, interested in the subject of calendar reform and in any constructive steps taken in this direction.—F. F. Hill, Governor, Farm Credit Administration.

As a mere expression of opinion it may be said that a revision of the calendar upon a basis of international standardization would seem very desirable if it were adopted by the different nations and would doubtless accomplish much toward simplifying operations in compiling and comparing statistics and using records involving reference to dates and different periods of time.—Frank T. Hines, Administrator, Veterans Administration.

Our views on this subject are well expressed in the Central Statistical Board's report on calendar reform to the Secretary of State. A perpetual calendar, by simplifying and reducing our statistical work and by increasing the accuracy of our interpretations based on statistical data, would be of great help to us. We hope for further progress in the movement for calendar revision.—L. P. Bethea, Assistant Secretary, Board of Governors of the Federal Reserve System.

HOLIDAYS THROUGH THE YEAR

By James L. C. Ford

HOMELESS waifs, our holidays wander to and fro across the calendar without a spot to call their own. All through the ages, these festal days and anniversaries have been the tramps of time. Lunar vagaries, calendar revision, and just downright human carelessness have turned them into unreliable festivals dependent on the whims of every passing year.

Now The World Calendar has come to the rescue of these poor calendrical vagabonds. No longer do they need to roam through the week, dropping in on Sunday, Monday, Tuesday, as the case may be. Now each may have his permanent abiding place, safe and happy in the knowledge that for all time to come neither moon nor man will chase him through the week.

Consider the past. Take your own birthday as an example—never a year when you can be sure on what day of the week it will fall. Probably not one reader in a hundred can recall whether he was born on Wednesday or Friday. Certainly not one reader in a thousand can name with certainty the Sunday on which Easter will fall in 1939—not until he has consulted the almanacs gotten up by wise men who read the heavens.

All this confusion and uncertainty can be banished overnight by the simple regularity of the reliable perpetual calendar which we have come to call The World Calendar. With its fixed dates of week and month for every holiday, it offers a host of holiday help to the clergyman and his church feasts, the business man and his seasonal trade, the working man and his leisure plans. Simplicity is its key-note, regularity its boon.

Examine the calendar with me, month by month and week by week, and observe the benefits of holiday observance by a modern plan.

First, January: New Year's Day, that gala time of new resolutions, under The World Calendar will always fall on Sunday, January 1st, with the working week beginning the day after, Monday, January 2d. Because of the extra Saturday, Year-End Day, preceding January 1st, the customary Monday holiday would be abandoned. The three-day week-end would afford millions of workers an extra long week-end for celebrating and rest.

On January 6th, observed as the church festival of Epiphany in Roman Catholic countries, The World Calendar will set Friday as the annual weekday date. And the previous evening, known in old England as Twelfth Night and made famous by Shakespeare's charming comedy of that name, will always fall on Thursday.

January 20th will be a Friday also, and for American citizens it will mark the day when, every four years, a President of the United States is inaugurated in Washington with pomp and circumstance. This important

American political event, which had its debut in 1937 after a century of March inaugurals, undoubtedly will grow in importance and meaning in years to come.

February is especially a holiday month for Americans, for the birthdays of our two greatest Presidents fall in the second month which for years was a stepchild in the calendar until The World Calendar gave it equality with its sister months.

Abraham Lincoln's birthday on February 12th will come on a Sunday. As a legal holiday, it undoubtedly would be observed on Monday in most of the 48 states. George Washington was born on February 11th in reality, but the Gregorian reform of 1752, when the first President was 20, altered his birthday to February 22d. Under The World Calendar, February 22d is Wednesday. It would be possible, however, to observe this legal holiday once again on the actual date of birth, February 11th, Saturday, and thus combine these two patriotic presidential holidays in a glorified week-end full of patriotic meaning.

According to The World Calendar, Ash Wednesday, the religious festival marking the beginning of Lent, would fall on February 22d every year, benefiting church ceremonies and aiding many a merchant who could plan definitely for months in advance exactly how and when to meet trade conditions during the Lenten season.

Valentine's Day, beloved by children and sweethearts, falls on February 14th. In The World Calendar this will always be a Tuesday.

Then comes the month of March with only one lonely holiday after the February festivities. All good sons of Erin honor their green isle on March 17th by observing St. Patrick's Day. This, a Sunday holiday according to The World Calendar plan, might well be celebrated on the Saturday preceding this date, and thus not interfere with mid-week celebrations.

April is a month particularly marked by holiday peregrinations in the past. Easter, the most important of church festivals, has roved from one end of the month to the other. As a movable feast, it has not even had a regular monthly day, although Sunday has fallen to its lot by the very nature of the solemn anniversary. In the past, Easter has varied according to whether the full moon next after the vernal equinox has fallen nearer or farther from the equinox. Easter has always been the first Sunday after the full moon on or next after March 21st and so it has the whole period between March 22d and April 25th, 35 days, in which to ramble around. And yet if the full moon happens upon a Sunday, Easter is observed the Sunday after. This range of uncertainty has brought hardship and inconvenience to business men, travelers, teachers and farmers. It has made annual adjustments necessary for thousands of clergymen and millions of churchgoers. Although authoritative action on the date of Easter can only

be taken by the official church bodies, there is a considerable body of opinion in favor of The World Calendar proposal of the second Sunday in April for Easter, year in and year out. Easter then would be April 8th. And a whole host of other church holidays, fixed by the date of Easter, could then take up their regular and permanent abodes on definite days of the week and month. For example, Good Friday then would always fall on Friday, April 6th. This would be of especial importance in England, for Good Friday is a Bank Holiday there and as such calls for a complete suspension of mercantile and political activities. Easter Monday, which would come on April 9th, also is one of England's great legal holidays.

A number of secular holidays also are celebrated in April and The World Calendar also would give them a definite week date. Many of the old Confederate States observe their Memorial Day on April 26th, which would be a Thursday. Arbor Day, another spring festival, has shuttled through the month of April without even a definite day of the month to call its own. Now it could be fixed on Tuesday, April 10th, or Sunday, April 22d, as desired.

May truly is a month of many special occasions. Its first day, May 1st, has been May-Day for years and May-pole dances, May-baskets and May-queens have celebrated the flowering spring. In late years it also has become known as a special day for labor meetings and parades and has assumed an international importance on that account. By annual presidential proclamation it also has been named as Child Health Day. In England it is one of the six important Bank Holidays. Every May 1st by The World Calendar plan would fall on Wednesday.

Among the other May holidays is Mother's Day, which in the past has been without a regular monthly date, as it has been observed on the second Sunday of the month. The World Calendar would give it Sunday, May 12th. The patriotic holiday of the great British Empire falls on May 24th, the birthday of Queen Victoria. This Empire Day would be Friday by The World Calendar. Whitsunday, the church feast celebrating the descent of the Holy Ghost on the Apostles, is of great importance in the Church of England and Whit-Monday is often observed as a business holiday. Both have depended in the past on a movable Easter, but under The World Calendar they would fall on Sunday, May 26th, and Monday, May 27th, respectively. Memorial or Decoration Day, a patriotic day of remembrance for most Americans, is May 30th and by the perpetual calendar system would be a Thursday, or might be observed simultaneously with the Whit-Monday holiday.

June has its special holidays but for many a couple June means a day of individual and personal significance, their wedding anniversary. Think of the aid and comfort it would bring to many a poor, forgetful husband if in the future he could depend on a definite day of the month and week,

year in and year out, and fix that in his memory. A few calendar milestones will stand out in the mind if they are fixed and regular instead of depending on astronomical eccentricities.

June means two American festivals and an old English holiday. In nine southern states, the birthday of Jefferson Davis, President of the Confederacy, is remembered on June 3d (Sunday in The World Calendar). Flag Day is June 14th, which would be a Thursday. In England, Midsummer's Eve was a pagan festival falling on June 23d and the old rites and beliefs are commemorated even today for many theatergoers who have fallen under the spell of Shakespeare's lovely play. Midsummer's Eve, under The World Calendar, would be a Saturday evening.

And, in leaving June, we must not forget the quadrennial holiday which The World Calendar would give us—Leap-Year Day, June L or 31st, an extra Saturday following June 30th in leap years.

The Fourth of July by its very name marks a definite day of the month on which we celebrate our Independence. The World Calendar would mean that the Fourth of July would come on a Wednesday. But a week-end celebration would appeal to many people during the vacation months and, by legislation, our Independence Day could be advanced two days to Monday, July 2d. Historical fact also would sanction such a change, for the Declaration of Independence was actually adopted by the Continental Congress on July 2, 1776, although not officially issued until two days later.

Another national holiday in July is observed by our next-door neighbor, Canada, on July 1st, their Dominion Day, and, according to The World Calendar, it would be a Sunday. Over in France, the national holiday is Bastille Day, which falls on July 14th, and commemorates the storming of the old Paris fortress. July 14th is Saturday under our perpetual calendar plan.

August, the harvest month by British tradition, has its English harvest festival, one of the important Bank Holidays, on the first Monday of the month. This would be August 6th as calculated by The World Calendar.

September is our own harvest month and on the first Monday in September we celebrate Labor Day as a national legal holiday. The perpetual calendar would place that date on September 4th. Another American anniversary which we observe in September is Constitution Day, which has September 17th as its fixed monthly date and, under The World Calendar, would have Sunday as its fixed weekly date.

October has two red-letter days which we remember. The first is Columbus Day, commemorating the discovery of our continent. It falls on October 12th, a Thursday by the reformed calendar. The second, a jolly children's holiday, is Hallowe'en, October 31st, and Tuesday by our modernized system of reckoning time.

Holidays throng the month of November. Election Day has been set

in the past by the rigmarole of "the first Tuesday after the first Monday in November." Applying this magic phrase to The World Calendar, Election Day hereafter would have to be Tuesday, November 7th. Four days later comes another memorial holiday in Armistice Day on November 11th, a Saturday by The World Calendar.

Thanksgiving Day, that fine old American turkey feast, heretofore the last Thursday in November, would be on November 30th, the last day of the month, for this year and next year and every year.

The gala month of December with its Christmas season demonstrates one of the chief advantages of The World Calendar. Christmas, December 25th, falls on Monday. Thus Sunday can be a day for holy observance of its religious significance and Monday a day for family celebrations and gift-giving. Business no longer would be disturbed by a mid-week holiday and swamped clerks could look forward to a long week-end of recuperation after the holiday rush.

In England, Boxing Day, the last of the great Bank Holidays, would fall on Tuesday, December 26th, adding still another day of leisure to the Christmas festival.

Finally we would have The World Calendar's own special holiday of Year-End Day, an extra Saturday following December 30th every year. Year-End Day would make for another of those luxurious week-ends, for December 30th would be a Saturday, then Year-End Day another Saturday followed by Sunday, January 1st, the New Year's Day celebrated all over the world. With this three-day holiday the work-a-day world would begin with Monday, January 2d, the holiday feature of the day after Sunday having been transferred to the Saturday preceding and used as Year-End Day.

Proof of the drawbacks of our present holiday system is self-evident. Legislators in the United States Senate and in the state legislatures of New York and New Jersey, as pointed out by an editorial in the *Journal of Calendar Reform* for March 1938, already are aware of the problem and are trying to solve it by definite Monday holiday plans. There is a certain amount of merit in these suggestions.

Wisdom and common sense suggest they could be combined with the universal advantages of The World Calendar system in which all uncertainty would be banished forever.

Science and system are the goals of modern life. Nowhere do we need them more than in our method of figuring time. Only The World Calendar can provide a stabilized and definite arrangement for our holidays and end the ridiculous confusion which has made them the tramps of time.

WORLD CALENDAR ASSOCIATION

Its Educational Aim

By ELISABETH ACHELIS, *President*

MEMBERS and friends of The World Calendar Association will be pleased to learn that after many years of effort we have succeeded in officially establishing the *educational character* of our work with the proper authorities at Washington.

It will be recalled that the purpose of organizing The World Calendar Association, October, 1930, was to educate the public to the defects of our present calendar and on the benefits a revised calendar would bring to the world. It was also specifically the intention of the organization from the beginning to inform the public regarding The World Calendar, which retained the familiar 12 months but divided them into equal quarters and through the intercalary Year-End Day stabilized the year. The stabilization of the year had been proposed by Abbe Mastrofini as early as 1834 and had received authoritative scientific and astronomical approval at various later dates. The Association felt The World Calendar best fulfills modern-day requirements and upholds the best features of the present system. At the same time it zealously adheres to the astronomical accuracy of the true length of the year.

Naturally, the work of the Association required financing and a trust fund was established, the income from which was to be used to meet the expenses of the Association's various activities. Since the time of organization and because the educational character of the Association had not been legally established in Washington, it was necessary to deny to friends and members their frequently expressed desire of contributing for the work of the organization. Now, Washington's decision removes any such legal barrier against accepting welcome offers of assistance.

In its ninth year the Association looks back over an eight-year period of increasing activity and steady progress.

Eight years ago few knew that there existed a sane and rational solution to the calendar problem. Today there is a world knowledge of this plan. The World Calendar Association has a membership of 11,000 persons in 58 countries. Countless other thousands know the plan and are confidently looking toward its adoption.

Eight years ago a small central organization was started in New York to work for The World Calendar. Today committees and organizations exist in 28 countries.

Eight years ago nothing but a proposed 13-month plan was discussed in America. Today in college forums, chambers of commerce meetings and church groups, on lecture platforms, in the classrooms, in men's and women's clubs, over radio, in editorial columns of newspapers, pamphlets and books, the benefits of The World Calendar are constantly brought to the attention of the peoples of the world. The obvious superiority and irresistible appeal of The World Calendar have won it this support.

In 1931 only two nations had approved the 12-month equal-quarter plan of revision—Switzerland and Greece. Today 14 nations have officially stated they stand ready to place it in operation.

We are now confidently looking forward to December 31, 1944, when this much-needed reform can be placed into active operation. This is the date on which the old Gregorian and the new World Calendars meet on the same day and date, thereby making possible smooth and easy change.

We know we can depend upon our membership and friends toward attaining this desired objective by which The World Calendar will become the universal measurement of time within the near future.

THE PIT AND THE CALENDAR

By Clarence Henry

Educational Director, Chicago Board of Trade

NO business organization in the world works as close to the calendar as the Board of Trade in Chicago. It deals in grain—in wheat, corn, rye, oats and barley and soy beans, wherever they are grown, whether moved by ox-cart or streamliner. The buyers watch the process of growth with an interest as intense as the farmers', studying the seed as it tumbles into the plowed field, scanning the heavens for rain, measuring tonnage as the grain down-chutes into freight-cars and steamer holds. They are interested because the factors affecting growth also affect price.

For the same reason they pore intently over grain reports from the under side of the world in the Southern Hemisphere. Wheat is international and a bumper crop in Argentina influences the price in Chicago. It is said that the sun never sets on wheat; and that is strictly true. It is also true that the buyers follow the sun, from season to season, from month to month, almost from day to day. Its course determines the supply of grain; it also determines the calendar.

They cannot alter the one; they accept the other as it stands, along with millions of other human beings. But there is no doubt that a calendar of equal quarters would help to simplify the complexity of transactions that take place each day of the year in the various pits of the Board of Trade.

Consider that in a normal year farmers in this country produce three-quarters of a billion bushels of wheat, two and one-half billion bushels of corn, a billion and a quarter bushels of oats, a quarter of a billion bushels of barley, 40 million bushels of rye and upwards of 25 million bushels of soy beans which must find a market. The number of records that must be kept is staggering. The task of making comparisons is even more arduous. A changed calendar would not remove all the complexity, but it would make the work a great deal easier.

The Board of Trade is simply an organized market place, designed to serve both the producer and consumer. It does no business itself but merely provides a place where buyers and sellers the world over, through their representatives, may assemble and trade to satisfy the food demands of the two hemispheres.

Sales are divided into two main classes—in one class, the cash or "spot" transactions; in the other class, contracts for future delivery called "futures." The cash transaction is a sale as soon as completed, whereas the future contract is defined as "a contract to buy, or a contract to sell at some definitely future time." The chief delivery months are September, December, May and July and they correspond roughly to the year's four

quarters. They became the "future" months as a result of custom and have remained in effect, chiefly as a matter of convenience. However, they retain a connection with the month in which the grain is planted and harvested, and are intimately related to lake navigation and crop needs.

Whatever their origin, they are fixed and if business organizations could make their own calendar, that of the Chicago Board of Trade would be a year divided into four parts. To this might be added March and October to make a six-month arrangement, for those are months in which corn and soy bean futures are traded in.

At the beginning of the calendar year, active business in futures is ordinarily confined to the May and July deliveries. May is the month the ice in the Great Lakes melts and navigation resumes. Wheat with that month name attached to it is the old crop, that which has been held in storage. July labels the winter wheat which in July comes into harvest.

Early in March, September wheat—the crop sown in spring—begins to receive attention, and about June 1st, December wheat is being traded in. Trading in old crop or May wheat ceases, of course, with the passing of that month. But in July, contracts for the following May are taken up. This starts a new annual cycle.

For whatever month one buys grain, the first day of the month is the one on which he must be ready to accept delivery of his purchase, although it may not be tendered until the last day of the month, every delivery being preceded by a 24-hour notice of intention to deliver.

If a trader buys 10,000 bushels of May wheat, for example, he is absolutely sure of having 10,000 bushels of wheat delivered to him at some time during May.

There are also other ways in which the passage of the months affects those who spend their days in trading. Each period introduces new factors which influence price—and the price of grain not yet harvested or reposing in a warehouse can be raised or lowered many times.

For example, January and February are significant because in those months Australia, Argentina and South Africa harvest and load ships with their cereals. While America shivers, this freshly reaped grain moves into the market to compete with the grain which is in storage and paying for space there at an average rate of one cent per bushel a month.

From February to April, government and private experts roam the fields in which winter wheat is sprouting to ascertain the damage done by the cold. If it has been slight, a larger crop can be looked for, and the price will change accordingly. Likewise in May and June, they inquire: What of black rust? What of chinch bugs and green bugs and grasshoppers, any of which may drastically cut crop expectations? And so down through the year.

In July, August and September, they consider rains in the dust bowl

and other regions that produce the spring wheat. In October, among other things, they measure the winter wheat plantings.

Enough has been said to indicate the dependence of the grain buyer on the calendar, and how intricate is the trading process—enough to indicate how welcome any measure for simplification would be.

In practice, the system of trading in futures works smoothly and swiftly. For the great flour mills, the bakers, the feed manufacturers, and others who must have grain, it is an invaluable device for assuring an adequate and even supply of the commodity at a fair price.

The origin of this method of trading is said to go back to the Civil War when the Union Army contracted for future deliveries in order to be sure that the soldiers would have food. Some authorities date its origin to the year 1848.

Whatever the beginnings, the method eliminated violent fluctuations in price and led to the growth of large storage warehouses and gave the farmers of America a certain market for all they could produce. Before its inauguration, growers kept their crop in bins and cribs until they could dispose of it individually, handling it as grain had been handled since Pharaoh.

The history of the Board of Trade is the record of a continuous series of improvements and changes for the better handling of the great grain harvests. A simplification of our outmoded calendar may constitute the next step forward.

SOME ASPECTS OF TIME MEASURES

By Dr. B. F. Yanney
Professor of Mathematics, Wooster College

MALADJUSTMENT of weeks and months in our present style of calendar may be observed by taking any specified day of the month, say the first. Note how, in the course of a year, it zigzags through the days of the week, hitting three weekdays once each, three others twice each, and the remaining one three times. Of course, there are a few exceptions to this as a rule. A marked exception in one case should be noted. Obviously the 31st, since it is found in only seven of the months, is unique.

The many inequalities and discrepancies of our calendar have challenged many people, scattered all over the world, to devise a calendar at once simple of understanding and better adapted to the needs of many everywhere. Many have been the attempts to meet the demands, and many plans have been submitted for consideration to the League of Nations, which organization seems to be the logical one through which to get universal and concerted action in the matter of calendar reform.

Omitting recital of details, it seems fairly obvious from reports that have been sent out from the League, that of all the plans submitted only two have survived for serious consideration. More recently one of these two appears to be gaining ground steadily. This is not to be interpreted as meaning that the League is about ready to proceed with the necessary steps leading to adoption. There remains much yet to be done before such a stage is reached. But what is significant is that several nations have made commitments to the effect that they are ready to adopt The World Calendar. And more and more nations are saying without commitments, that if a change is to be made, it should be made in favor of The World Calendar.

A TIME TO EVERY PURPOSE

By The Reverend John Bovenkerk

Muskegon, Michigan

Member of the Committee on Calendar Reform of the Reformed Church in America.

Resolutions in favor of The World Calendar are urged by a Synodical Committee of the Reformed Church in America for consideration at the General Synod this year. The resolutions provide: "*Whereas*, the Gregorian calendar now in use has many inequalities and discrepancies, and *Whereas*, the League of Nations, to correct these defects, has proposed a new calendar retaining astronomical accuracy but balanced in structure and perpetual in form, which facilitates statistical comparisons, coordinates the different time periods and stabilizes religious and secular holidays, and *Whereas*, other denominations and churches have expressed approval of the proposed calendar, because of the particular advantages offered thereby to the church in its activities and administration; *Therefore*, Be it resolved by the Reformed Church in America in General Synod convened, that approval be given to the calendar known as The World Calendar proposed by the League of Nations." For the information of members of the church, the following study by Dr. Bovenkerk was published in the *Intelligencer-Leader*, official organ of the church. The title is taken from the Biblical text, "To everything there is a season and a time for every purpose under heaven."

IN THE proposed resolutions of our General Synod, the first consideration is: "That the Gregorian calendar now in use has many inequalities and discrepancies." Notice, please, the historical term, *Gregorian Calendar*. We have no finished product in the form of a calendar in the Bible by way of prescription. The Scriptures furnish the groundwork for it, but it appears that the Bible-writers adapted themselves to the current method of reckoning time in their own day and generation.

It is interesting in this connection to find that John's Gospel follows what we would call the modern Western reckoning of the hours of the day from midnight to midnight, whereas in the Synoptic Gospels and the Biblical narratives, the hours of the day run from sunrise to sunset.

The divine framework for all calendars is unquestionably found in Genesis: "And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years." Further, we are told that God made the sun "the greater light to rule the day" and the moon "the lesser light to rule the night," and "He made the stars also." That measuring-rod which we call a calendar is calculated from the movements of the celestial spheres. According to man's progress in knowledge and consequent improvement in instruments for more exact astronomical measurements, calendars have been made, used, changed and discarded.

It would seem that the Gregorian calendar, now in use, stands as a

link between our present scientific knowledge and that of our forefathers. It dates back to 1582 and came into being as a revision of the Julian calendar, designed by Julius Caesar, at the time he conquered Egypt, and a decided improvement in a day when the old world was crowded with all kinds of calendars, most of them pathetically irregular and all of them local and regional in their applications.

For many good reasons another revision is desirable today; however, the reform should be conducted with due respect for the traditions, in some respects sacred and Christian, and for the comparative usefulness of the previous calendars in their respective periods of service. Traditions of deep meaning and religious significance, particularly in relation to worship, are inseparably associated with those convenient instruments of time. A reckless, atheistic tampering with the calendar, such as marked the French Revolution in the 18th Century and the recent Bolshevist Revolution in Russia (with its five-day revolving week) cannot be tolerated by the Christian Church.

But the calendar reform that is now proposed is a step in the direction of better law and order and a better understanding between the great churches of the East and the West for the simultaneous observance of the Christian days of solemn commemoration and for other matters of spiritual interest. More about that later.

But what is wrong with the Gregorian calendar? What are the defects, and are those discrepancies of such a nature as to demand revision?

Without some understanding of the calendar's adventurous history through the centuries of time, it will be difficult to appraise the desirability of reform. And yet that history is very complex because of its intimate connections with astronomical calculations, the meaning and value of which are not readily appreciated by the masses of people, and because of the religious observances of nations and people which obtained recognition in the formation of calendars. A glance at this history will convince us of the great difficulty of establishing a perfect calendar.

Origins are generally shrouded in obscurity. Just when did people begin to feel the need of marking time? No one knows if the inquiry means a date or year. But we know that animals have an instinctive sense of times and seasons. Birds and fishes migrate at stated seasons; the beasts of the jungle come at regular times to quench their thirst at the waterholes. Man, the higher being, created in God's image, had from the beginning an innate ability to think God's thoughts after Him and to observe with sinless eyes His marvelous works. We have no writings of the early Hebrews other than the books of the Old Testament, and in them there is no record of any research into the mechanical explanation of the movements of the heavenly bodies. Nor should we expect to find in them an account of such research, since the Bible is not a book of science but the Self-Revelation of God to man.

In spite of the fact that in Hebrew observances the months have names and a number of stars and constellations are mentioned by name; and in spite of the fact that days, months, and years have their civil and religious significance, it is but fair to say that astronomy had not attained among the Hebrews the position of a science.

The reckoning of months and years was based upon observation by the naked eye, and in course of time the hours of the day were determined by a sun-dial. Every student of the Scriptures knows how difficult it is to arrive at an accurate chronology, and how confusing is the Jewish observance of civil and ecclesiastical months and years, based on the observation of the phases of the moon.

There is proof that the Hebrews, in course of time, used the solar as well as the lunar month and year, but the Mosaic legislation for the feasts was regulated by the lunar month. Bissell, in his *Biblical Antiquities*, says: "The days of the month were reckoned at 29 and 30 alternately. This would give a year of 354 days. The actual lunar year was longer by 8 hours, 48 minutes and 38 seconds. To correct this discrepancy, and adjust the calendar to the course of the sun, it was customary about every third year to add a 13th month, called 'Veadar,' that is, another Adar, that being the name of the 12th month. In a period of 19 years it required the intercalation of seven such months in order to bring the Jewish calendar into harmony with our own. We find nothing concerning this intercalary month in the Bible." A perfect year, a perfect month, a perfect week? Hardly.

It would be interesting to take up a discussion of the seasons. The Scriptures intimate that they began with the Deluge. In *The New Geology*, Dr. George McCready Price discusses the significance of the Flood—and suggests that there were no seasons before the Flood. The aspects of the heavens to man were not the same before and after the Great Deluge, not even at the equator. Here again is food for thought for those who are inclined to think that our present way of reckoning time has been in use during the entire period of the world's history. It is safe to say that the Hebrew calendar, though not a strictly scientific instrument, came into being after the Flood, gradually; and that Moses, the author of the Pentateuch, adapted himself to the manner of reckoning time then in use. That has nothing to do with the infallibility of the Word of God, to my mind. After all, we, too, adapt ourselves to the calendar now in vogue.

The *Jewish Encyclopaedia* deals with the Hebrew calendar as a gradual development. It speaks of three periods: *first*, the Biblical, when the heavenly bodies were observed, up to the Christian Era; *second*, the Talmudic, when observation became more accurate because of mathematical reckoning, up to about A.D. 500; *third*, the Post-Talmudic, when observation was no longer needed since the materials for reckoning were otherwise available, up to the present time.

The University lecturer in Rabbinic Hebrew at Oxford University, H. M. J. Loewe, writes in the *Encyclopaedia Britannica:* "The Jewish calendar is the result of long development; the present form is not of great antiquity. The ancient Hebrew names of the months disappeared in the Exile and were replaced by Babylonian names; but even before the Exile the months were more commonly designated by numbers."

We make mention of these things to show that the history of the Hebrews in relation to chronology and calendar presents considerable adaptation. The last word has not been said as to the influence of the Canaanites, Egyptians, and Babylonians on the method of reckoning time, the Jewish scholars bearing witness to this.

The record of ancient calendars gives interesting pictures of the battle between the sun and the moon for preeminence. By sheer observation it has always been much easier to set up calendars regulated by the moon. But a lunar year and a solar year are not of the same length. Both Babylon and Egypt began with the moon as a measurer of time; but about 4000 B.C. the minds of both countries came to grips on the same problem: the necessity of a solar year. There is no doubt as to the Babylonian intellect, for it is reported that one of their scholars calculated the length of the solar year as 365 days, 6 hours, 15 minutes, 41 seconds—which is only 26 minutes, 55 seconds too long. In spite of quite accurate calculations, the Babylonians continued the lunar month. Not so with the Egyptians. The latter were progressives and had the courage to abandon the lunar system as a basis. And yet, the Egyptians had a solar year of 360 days (12 months of 30 days each) plus five days (holy days, birthdays of their gods) added to make the number of days complete; total 365 days—not

correct, of course, according to modern astronomical calculation. It is interesting to note that the Copts in Egypt and Ethiopia, in our own day, still use that ancient Egyptian calendar with its intercalation of five days. In other words, it has been used for 25 centuries, at least.

We now pass on to the Julian calendar. Perhaps a better way to designate it would be to speak of it as the Roman calendar, for when Julius Caesar was assassinated in 44 B.C. the further reform was left in the hands of Augustus Caesar.

When Julius conquered Egypt, he made the Egyptian calendar the basis of his revision. A year of 365 days and six hours was established and the leap year of 366 days was introduced. The year was divided into 12 months; the even months were given 30 days each, and the odd months 31. We shall not speak of the confusing Kalends, Nones, and Ides in the months. Our present name of July comes from the great Julius.

Augustus, filled with a desire to be equal in importance with his famous uncle, persuaded the Roman Senate to name a month in his own honor and to allot 31 days to it. The month Sextilis was renamed August and the Julian arrangement of days was set aside. Result: not reformation but deformation. Look at your calendar: "30 days has September, April, June and November; all the rest have 31, excepting February alone . . ." This unreasonable irregularity, the freak notion of a proud emperor, has come down to us through the centuries.

Another idiosyncrasy of the so-called Julian calendar which we have inherited is the date of the year's beginning. It is another evidence of the perpetual warfare between the sun and the moon. Julius planned to begin the year with the winter solstice (December 25, now December 22), but complying with the traditionalists of his day, January 1 was fixed as the first day of the year, because on that date, at the time of adoption, the new moon appears after the winter solstice. It was a political emergency that forced this inconsistency upon the civil calendar so that it lagged behind the solar year by six days—but it was a serious defect, nevertheless.

We sympathize with Julius. He faced a formidable array of irregularities in the Roman calendar and was surrounded by the many anomalies of the Judean, Babylonian, Egyptian, and Greek calendars—not to speak of others—and did the best he could. We are sorry for his untimely death and the bungling job of his deified successor. However, the fact remains the world was still in a mess as to reckoning of time when Jesus was born. Just when was our Saviour born? Who knows how many years, months, and days the human race has "lost" up to the beginning of the Christian Era?

The Julian-Augustan calendar was meant for all time to come. But we have a "decline and fall of the Roman Empire." What happened to her calendar? It has been put this way: "As a fact the calendar conquered. As a form it was changed." For 15 centuries the essentials held their own, but there were gradual modifications. Briefly stated, as to form, the Julian-Augustan calendar was too Roman. Its chronology went back to the founding of Rome (753 B.C.) and was unable to bind the whole course of human events to those chariot wheels. It was doomed with the Roman Empire.

It is customary to attribute the calculation of the Christian Era to a Sixth Century scholar, Dionysius Exiguus, better known as Denys the Little. This monastic theologian exerted sufficient influence to make the calendar a litany of adoration of the advent of our Lord. The initials B.C. and A.D., though anomalous, are very significant, dividing the course of history into two comprehensive eras. But the consensus of opinion today is that our friend Denys was not altogether correct in his calculations. When was Jesus born? The date of the death of Herod the Great has been well established: March, 4 B.C. The birth of Jesus was before this. It may be placed with considerable probability in the latter part of the previous year, though there is no certainty as to the month and day. The point in our discussion is that the ordinary dating of the commencement of the Christian Era seems to be four years too late. The celebration of the advent of our Lord and Saviour is most fitting and laudable, but if perchance it is thought that our date of commemoration is correct and

that our chronology is faultless, the suggestion is in order to study the historic development of the calendar.

With the passing centuries some defects of the Julian-Augustan calendar were becoming more apparent and a revision was deemed necessary. Pope Gregory XIII, with the advice of prominent astronomers, mathematicians, and churchmen of his day, instituted a new calendar. The Gregorian calendar was promulgated in the year 1582; but the reform virtually goes back as far as the Council of Nice, 325 A.D.

Look at that year 1582! In 1572 there occurred the massacre of St. Bartholomew. Multitudes of Protestants regarded the innovation as a Papal Bull, concocted in the Vatican. In Roman Catholic countries the new calendar was accepted at once. In Protestant countries there was vehement altercation. In some quarters the Pope was accused of deliberately postponing the second coming of Christ and the end of the world. To us it is significant, however, that the Netherlands adopted the Gregorian calendar in 1583; only one year after its promulgation. Great Britain accepted it in 1752; Sweden, in 1753.

The Gregorian Reform included the following essential features: Easter remained the acknowledged Christian day of commemoration but was not given a regular date. Leap year was rectified so that three out of every four centurial years were made common years; the centurial leap years being those which are divisible by 400 without leaving a fraction (like 2000). The solar year of 365 days, 5 hours, 49 minutes and 12 seconds was adopted. The seasons were restored as they appeared at the time of the Council of Nice, placing the beginning of spring on March 21 and not on March 25 as it appeared in the Egyptian and Roman calendars. The beginning of the year on January 1 was retained. To make this reform effective, ten days were discarded.

That the Gregorian calendar is a better instrument than all previous calendars is obvious. But it is not satisfactory. The divisions of the year, the months, quarters and half-years, are of unequal length. The calendar is not perpetual; it changes each year. The dates of certain commemoration days change every year. Take Easter for an example. There can be a difference of 35 days between its first date (March 22) and its latest date (April 25). What a nuisance! As it is, Christian and national festive days, though fixed on definite dates (New Year's, Independence Day, Christmas, etc.) fall on successive days of the week, shifting from year to year. How awkward!

Of course, it must be recognized that the fundamental flaw in our calendar system lies in the fact that the year, roughly speaking, contains not 52 weeks, but 52 weeks plus one day. On the basis of astronomical data, the problem of perfecting an instrument, both accurate and practical, is very complex, if not impossible. The best that can be done, it appears, is to improve the calendar. The claim of calendar reform is not a perfect instrument, but a better one.

In a sketchy way we have reviewed the history of the calendar and some of its revisions from ancient days till the present era. Time marches on, but man has had great difficulty in dividing time so as to satisfy the imaginary and real demands of the human race. Not only must the sun and moon have their due, nations and peoples with their various religious traditions, beliefs, and observances clamor for proper recognition. Is it possible to devise a calendar that will meet all the requirements? Personally, I answer No. Were the human race homogeneous instead of heterogeneous—as it is and will remain till time shall be no more—the attempt would be far more successful. Yet, even at that, the astronomical difficulties are such that they can never be overcome except by some sort of patchwork. A perfect calendar is impossible in an imperfect universe.

Enough has now been said to substantiate the first *Whereas* of our

General Synod's resolutions: "The Gregorian calendar, now in use, has many inequalities and discrepancies."

The second part of the proposed resolution is: "Whereas: the League of Nations, to correct these defects, has proposed a new calendar retaining astronomical accuracy, but balanced in structure, and perpetual in form, which facilitates statistical comparisons, co-ordinates the different time periods and stabilizes religious and secular holidays."

The League of Nations has considered calendar reform for some years. Many calendar plans have been brought unofficially to the attention of the League, but only two have merited its serious consideration. They are a 13-month proposition, the so-called International Fixed Calendar, and a 12-month plan, The World Calendar.

Both proposed calendars aim at astronomical accuracy (by way of accommodation) ; both try to present a balanced set-up; both are "perpetual" in the sense that the same calendar remains the same annually. The last point is no gain to the honorable guild of typesetters and printers, but constitutes a tremendous saving to the public.

Both calendars also propose stabilization of Easter. It was first thought to date Easter on the first Sunday after the second Saturday in April. In either set-up, that would be the 15th, but the 15th is in the middle of the month and on that account, because of customary business transactions, not very desirable. Easter on April 15 would also put Good Friday on the 13th, a date that might accentuate superstitious notions. It is now strongly advocated to fix the date for Easter on Sunday, April 8. Advantages may be stated as follows: It does away with the nuisance of a constantly shifting date of commemoration. It falls as nearly as possible on the historic date. This date is appropriate in connection with the observance of related Christian festivals, putting the latter on acceptable days and dates (Palm Sunday, Good Friday, Pentecost). April 8 is peculiarly free from established business transactions, thus intensifying the spiritual significance of the Resurrection.

As to secular holidays, both calendars advocate their stabilization. All reformers seem to agree upon the advisability of placing holidays on Monday as far as possible. A great economic saving in the closing of places of business and factories is thereby insured. However, the matter of national holidays is in our discussion of minor importance. It, furthermore, will be open for adjustment by the various nations; so we shall say no more about it.

In the choice of either revised calendar, as proposed, the intercalation of two extra days, one every year and the other every fourth year, is unavoidable. A little difference may be noted, however. In the International Fixed Calendar, with its 13 months of 28 days each, the extra day is placed on December 29, but it is denied its place in the week; it has no weekday name; it is a "blank" day. It gives the appearance as though this day floats in space without being an integral part of measured time. In The World Calendar, Year-End Day is not so regarded. Virtually, this day is the old December 31; but it is converted into a double December 30, a second Saturday, and may be likened to the extra day a person gains when he travels from the Eastern to the Western Hemisphere and crosses the International Line at the 180th Meridian in the Pacific. Thus this twin day, counted into the last week of the year, gives the year its due of 365 days.

Likewise, Leap-Year Day, recurring as an extra day every fourth year, is placed in the 13-month calendar on June 29, unrecognized as a weekday, whereas in the 12-month calendar it again doubles the Saturday of June 30. It is clear that by this latter arrangement, January 1 and July 1 would always fall on Sunday, thereby insuring the

regularity of the week, eliminating the possibility of a shifting Sunday, and making the calendar perpetual. Every year, New Year's Day would be on Sunday—a proper beginning, it would seem.

There are a number of other features, and more important, which make the 12-month calendar superior and preferable to the 13-month calendar. At the first glance, the latter with its 28 days in the month looks tempting: four weeks of seven days in each of the 13 months, and every month commencing with Sunday. This set-up seems simplicity itself. Why not adopt it?

It may be said that if a calendar is nothing but a mechanical instrument to measure time according to a mathematical formula, conceived of in an abstract way, the 13-month calendar would be acceptable. If, however, we feel in duty bound to adhere to astronomical phenomena as a framework and pattern for our calendar and therefore impelled to adapt our instrument to the reality of cosmic order, the sheer idea of 13 months becomes an absurdity. That number 13 is a major factor. You cannot divide it into equal halves and quarters. The month Sol is a fictitious device. With 13 months, the lunar cycles, 12 of them, and the seasons, determined by the solstices, are disregarded, practically wiped out. The very rigidity of the 13-month calendar constitutes an argument against it. What we need is a balanced calendar, one that recognizes the reality of things and is eminently practical.

Thirteen months: it throws all ordinary calculations out of gear! Thirteen monthly periodicals, 13 monthly financial statements or reports, 13 monthly payments for rent, insurance premiums, salaries, notes payable. Obviously, the fractional computations involve much labor and expense. Besides, it is customary to observe the first and 15th of the month as dates when payments become due; these dates in the International Fixed Calendar would always fall on Sunday, thus either retarding or advancing such payments. In their eagerness for an efficient and standardized calendar, the proponents of the 13-month calendar usher in a state of complicated and annoying readjustments, if not confusion, in the business world. From a practical, workable point of view, this device of 13 months in the year is a great nuisance and overshadows certain desirable features in it, which in the abstract look inviting.

In comparison, the 12-month calendar would occasion far less adjustment, and on a sane basis. The World Calendar recognizes the number 12 for astronomical reasons, acknowledges the importance of the solar year over the lunar cycles without discarding them or minimizing their value to agriculture and other seasonable businesses, takes into consideration the 12 signs of the Zodiac to which the 12 months are easily related, and avoids the fractional computations inherent in that impossible and unscientific number 13, upholding the traditional, sanctioned, scientific number 12. Let me quote: "In all cosmic conditions, which obey universal law and of which the earth is a part, there exists an obvious system of regularity within a certain freedom of variety. There are individual characteristics of differences within the four seasons, the four directions and among the 12 signs. This is within the realm of pure mathematics—verities which constantly amaze the scientist. The whole universe would groan under a false division of time (a 13-month year) which does not conform to its rule." A calendar, functioning as a living, throbbing guide, must possess unity within multiplicity. The 12-month calendar approaches that ideal much more so than the 13-month calendar.

It would be interesting to go into detail demonstrating the very radical reform called for by the advocates of the International Fixed Calendar. Suffice it to say that it demands the moving over of 337 days to new dates and the specific readjustment of 29 days. The first 28 days of January remain untouched, but all the rest are transferred to other dates. When we think of the many historical dates and cherished anniversaries that would have to be reset in a new and strange frame, we realize that such a reform is really a radical revolution. Now place The World Calendar alongside of your present calendar and you will discover that, by retaining the 12 months, the changes have been reduced to a minimum. The specific change of days in The World Calendar is only seven. By the retention of the fundamental structure of the Gregorian and previous calendars, The World Calendar does not upset to any great extent historical records, encyclopaedias, text books, birthdays. The disturbance is compara-

tively slight. In comparison to the gain resulting from putting into usage a more efficient instrument, the loss is negligible. Nothing good, having the quality of permanency, is obtained without sacrifice.

Conscientious objection has been raised against disturbing the weekly cycle. In our present set-up, the annual extra day comes in the regular succession of the days of the week, and thus the continuity of the seven-day weeks is preserved. One does not notice that extra day so much, because it is one of the regular seven. In the proposed reformed calendar, the extra day is added at the end of the year, doubling the Saturday, and giving eight days to that last week. Confessedly, this is an adjustment altering the sequence of the seven-day cycle. The question arises, however, whether or not one should take offense at this adjustment or tolerate it because of the recognized gains of the revised calendar over the old.

The *Encyclopaedia Britannica* states: "The week is a period of seven days, having no reference whatever to celestial motions—a circumstance to which it owes its unalterable uniformity. . . . It has been employed from time immemorial in almost all European countries; and as it forms neither an aliquot part of the year nor of the lunar month, those who reject the Mosaic recital will be at a loss, as Delambre remarks, to assign to it an origin having much semblance of probability."

Of course, we do not reject the Mosaic law; we accept the seven-day week as a divine institution, based on the pattern of creation. Furthermore, as Christians, we do not apologize for the observance of the first day of the week as the Day of the Lord Who "maketh all things new," leaving the keeping of the seventh day to the Jews and the Seventh-Day Adventists as they see fit. But, for one thing, The World Calendar does not interfere with the conscientious observance of either Christian or Jew. The period of working days in that last week of the year is six, the extra Saturday is a holiday. If Jews and Adventists want to make the second Saturday their holy day, they are welcome to it; we, Christians, shall keep our Sunday.

To my mind, the contention, to the effect that the weekly cycle should not be disturbed, can be and is, in some quarters, greatly exaggerated. I have intimated before that a perfect calendar is out of question and that the intercalation of an extra day is simply unavoidable in a solar year; the sane thing to do is to make allowance. The little sacrifice (if it be so regarded) is fully worth the gain of a better timing instrument.

If objectors argue the sacredness of the number seven on the basis of the Old Testament, the reply may be made that the number eight is also a holy number, and that seven times seven, or 49, is climaxed by the number 50. I have before me an editorial clipped from the *Sunday School Times* of April 2, 1932. Forgetting that it is now out of date, the contents, severely condemnatory of calendar reform, are far from convincing. The impression is given of an uninterrupted cycle or series of seven-day weeks from the beginning of time and strong indignation is expressed that now an attempt is being made to disrupt the historic week and dislocate our Sunday by the insertion of a "blank day." We modestly ask for convincing proof, in the light of history, to substantiate the assertion that the Sunday now observed is still, actually, really, the first day of the week. For that is the premise on which the arguments of the indictment are based. To our way of thinking, the history of calendar reform through the centuries—and that is part of History—proves the very opposite. Our reckoning of time is not exact. Our chronology is off. It is easy to speak traditionally about an uninterrupted cycle of weeks from the time of the creation on, but to prove one's contention is quite another thing. And are we not in danger of becoming literalists by an over-emphasis on the exact day? Let's take a trip around the world, as previously suggested, and see how we come out.

On the whole, The World Calendar is the best instrument devised and, instead of giving "a mortal blow to religion," it comes to the aid of religion in a systematic and unifying way. The stabilization of Easter, among other good features, more than offsets the supposedly detrimental intercalation of an extra day.

We are now ready to discuss briefly the last "*Whereas*" and the "*Now, Therefore,*

Be It Resolved" of the proposed resolution of our General Synod. First, we shall substantiate the assertion of the Synodical Resolution that "other denominations and churches have expressed approval of the proposed calendar." This, again, is a long story, so it must suffice to furnish only a few of the more important items.

Cooperating with the Federal Council of Churches and the Universal Christian Council, the United Press issued to a representative list of leading American clergymen a questionnaire designed to make clear the attitude of the American churches on calendar reform. The replies received indicate that American clergymen favor general reform by a vote of 9 to 1. They favor Easter stabilization by more than 10 to 1. They prefer the 12-month equal-quarter plan, as compared with the 13-month plan, by about 7 to 1. This favorable attitude can be supplemented with the endorsements of a great many of the leaders in our Protestant Denominations, who, after studying the matter, are convinced of the benefits of the proposed 12-month calendar as it concerns the activities and administration of the Church.

The Universal Christian Council is a significant federation with headquarters at Geneva. It embraces all major Orthodox, Anglican, and Protestant bodies throughout the world. At its head are four presidents: Dr. William A. Brown, representing the American Section; the Bishop of Chichester, representing the Archbishop of Canterbury and the Anglican Church; Archbishop Germanos, representing the Eastern Orthodox Church; and Pasteur Marc Boegner, representing the Continental churches. This Council in 1936 voiced its enthusiastic endorsement of The World Calendar. Here it is:

> Whereas the Universal Christian Council at its Eisenach meeting in 1929 expressed its desire for a careful study of calendar reform and Easter stabilization; and Whereas the Council in 1932 instituted an intensive study of these subjects by its Research Department; and Whereas these studies and reports from the Churches have shown that a reform of the calendar and the stabilization of Easter would, if carried through, receive the support of the overwhelming majority of the Churches, providing it is based upon the perpetual twelve-month equal-quarter plan proposed by the League of Nations; Therefore be it resolved that the Universal Christian Council instructs its Standing Committee on Calendar Reform, to notify the Secretary General of the League of Nations concerning the above report and to secure the most effective presentation of this action of the Churches at the forthcoming world conference on Calendar Reform and the stabilization of Easter and finally That this Council asks the Churches to inform their respective Governments of this action and of their views with regard to the desirability of adopting the new calendar.

Notice, please, that this decision was reached after an intensive four-year study of the subject by the Research Department of the Council. The two plans proposed by the League of Nations were carefully and impartially studied, upon the ground that it would be helpful to all walks of life to have stabilization of the calendar, and thus would add to the unity of the spiritual relations between the Eastern and Western churches. Questionnaires were sent out with literature that included material advocating both the 13-equal-month and the 12-month equal-quarter plans in order that the churches' opinion might be ascertained. No discrimination was shown. An overwhelming approval of the perpetual 12-month calendar was the result.

It is also of interest to note that the first church which took any definite stand on the question was the Eastern Orthodox Church. One reason for this is doubtless found in the state of transition that marks this church in general, and the confusion that still prevails among its groups in the changing over from the Julian to the Gregorian type of calendar (in Bulgaria, Poland, Yugoslavia, and Jerusalem, Julian dates are still in vogue). The Eastern Orthodox Church needs the support of all Christendom in view of the situation in Russia.

The Roman Catholic Church has not rendered an official endorsement through the Vatican. But there are a number of warm advocates in that important communion. Before me lies a splendid article by the Reverend Edward S. Schwegler. It is a scholarly exposition of the shortcomings of the Gregorian calendar as applied to the liturgical observances of the Roman Catholic Church and a brilliant defense of the proposed 12-month calendar as a much more suitable instrument for liturgical purposes. Among the defenders of the new calendar in the Roman Church are Father Panzarasa of the University of Turin, Italy, the Abbe Chauve-Bertrand in France, and the late Abbot of Farnborough in England. The latter has been called "the foremost liturgical scholar."

Cardinal Ehrle, late librarian and recorder of the Roman Catholic Chuch, has characterized The World Calendar as "having the big advantage of making no more changes in the present calendar than are absolutely necessary." Indications are that the Vatican will approve The World Calendar and subsequently harmonize it with its many liturgical observances.

The Vatican has already notified the League of Nations that "there is no dogmatic objection to calendar reform" and that the Holy See opines that the question should be considered by an ecumenical council before definite action is taken. In the words of Father Schwegler: "May it not be hoped that another Gregory will put his authority behind the growing movement to simplify further and standardize that calendar that has borne the name of a Pope for over 350 years?"

We cannot very well take the time and space to record the official decisions of all Protestant churches *in re* calendar reform and specifically in favor of The World Calendar. The following letter of recent date is illuminating. It is addressed to the President of the United States and the Secretary of State, by the American Secretary of the Universal Christian Council:

Dear Mr. President:

At an earlier date it was my privilege as American Executive of the Universal Christian Council to forward to you and to the Secretary of State for your records the report of the action of the Federal Council of the Churches of Christ in America and of the Universal Christian Council in connection with the request of the League of Nations concerning the attitude of the Churches of the world in the matter of Easter stabilization.

At this time, in view of the request of the League, which I am given to understand has been transmitted to all nations whether member states or otherwise, I am venturing to lay before you for inclusion in your records and for such attention as the matter may deserve, a brief dossier of further facts relevant to the Churches and Calendar Reform.

I would respectfully call particular attention to the resolution taken by the Council at its meeting in Chamby, Switzerland, August 21-26, 1936. Pursuant to the last paragraph of that resolution and with the authorization of the Federal Council's Department of Relations with Churches abroad, of which I am secretary, I am reporting for the Council the results of its own studies which show a quite general readiness on the part of the Churches of the Protestant Faith for a reform of the Calendar along the lines indicated by the proposals of The World Calendar Association.

May I simply express the personal hope that in this matter, so obviously free from political complications, the American Government may find it possible to act with other governments to bring about a change which seems highly desirable and which will rid the world of at least one basic disunity by bringing all nations and Churches to the use of the same Calendar.

Yours faithfully,
Henry S. Leiper,
Executive Secretary.

I close. Much more might have been written, but it has been a pleasure to open up a rather new field of thought. The perfect calendar will never come. As Robert Bridges has said: "Our stability is but balance." But a better instrument is in the making and there is urgency about its acceptance.

We agree with Lord Desborough when he expressed his ardent wish in the House of Lords "that this long-needed reform of the calendar and the stabilization of Easter may be introduced to the great advantage of the world" at an early date.

As Solomon said, "To everything there is a season, and a time to every purpose under heaven." And regarding calendar reform, quoting the words of the Archbishop of Canterbury, "It would be a real misfortune, if this matter were allowed to drift."

BACKWARD AND FORWARD

By Dr. Dinsmore Alter

Director of Griffith Observatory, Los Angeles

LECTURES in the Los Angeles Planetarium recently had to do with the Romance of the Calendar. The several-thousand-year history of our calendar and of the attempts to reconcile it to predetermined feast days marks one of the most interesting of all the developments of human civilization. No one knows even approximately the era in which the length of the year first was determined with fair accuracy. We do know, however, that often, despite a better knowledge, a very poor calendar was used. The old Egyptians, for example, had twelve months of thirty days with a final supplementary period of five days. Rather interestingly this falls in with the latest proposal of a calendar which would give us twelve months and then a Year-End Day that is not a member of any of these and might be thought of as an extremely short supplementary period.

Most of the difficulty with the calendar has resulted from a desire on the part of superstitious human beings to make the first day of each month a new-moon day. Even today the Mohammedans follow this and use a year that is eleven days too short. In 594 B. C., Athenians attempted to reconcile the inconsistencies of the sun and moon. The observations of Thales or of other astronomers of that time had shown that there are approximately twelve and a half lunar months to the solar year. Solon, therefore, placed twelve such months in one year and thirteen in the next one. This improvement, however, was imperfect enough that it soon was necessary to change from this simple ratio to a more complicated one, and the numbers of so-called "full" and "empty" years did not remain equal. A little later the system had come under political influence so much that the city council would increase its term of office by decreeing a full year shortly before the expiration of its term. Aristophanes pokes fun at them for this, when, in 423 B. C., in his comedy, "The Clouds," he says:

> Yet you will not mark your days
> As she bids you, but confuse them, jumbling them all sorts of ways.
> And, she says, the gods in chorus shower reproaches on her head,
> When, in bitter disappointment, they go supperless to bed,
> Not obtaining festal banquets, duly on the festal day.

The Romans, much more practical, solved all the difficulty and for a long time the first day of the month actually was the day that the thin crescent moon was first viewed after the astronomical new moon. When it was seen, they sent a courier over the city to ring a bell, and with the ringing of the bell the month began. It is interesting that this same prac-

tice was copied by the Mohammedans and used to very recent times, for they had signal fires laid from Mecca west across the northern part of Africa, in order that the first of the faithful who would glimpse the crescent might light the fire, and others, catching the sight, would kindle theirs, until finally all Mohammedan lands were feasting.

The first scientifically conceived modification of the calendar was that made by Sosigenes and adopted by Julius Caesar to begin with the year 45 B. C. This calendar was an excellent one, with 12 months of alternately 31 and 30 days each. It was spoiled soon upon its adoption, owing to the vanity of Augustus Caesar. His birthday month, renamed "August" in his honor, had only 30 days, which he felt made it inferior to the 31-day months. Therefore he ordered it lengthened. A day must be taken from one of the other months and added to August. February attracted his attention because of the leap-year variation in its length.

Our year is not exactly 365¼ days long. Such a year gains about three days in 400 years over the true tropical year. By the sixteenth century the change in date for the beginning of spring had become rather serious, so that spring began on March 11 instead of the twenty-first. Pope Gregory XIII corrected this matter by a decree that years divisible by 100 should not be leap years unless they also were divisible by 400. Even this is not quite perfect, but it will take more than 3000 years for our calendar to fall in error by one day. It is probable that by that time the League of Nations will decree the dropping of a single day. Gregory, in adopting this new form of calendar, turned back to the year of the Council of Nicaea, the most important of all church councils, and the one which had made the rule for the date of Easter. He wished the Julian calendar and his improvement to read the same for those important dates.

In commemoration of the Council of Nicaea, which made important calendar changes, our planetarium demonstration opened with the sun, moon, planets and stars exactly as they appeared on the morning of May 20, 325 A. D., the day that the first church council session was held. The observatory was not satisfied with merely running the planetarium backward to this date, but Dr. E. C. Bower, one of the lecturers, calculated the perturbations, thus insuring accuracy for the positions. During the demonstration the visitor in the planetarium universe, therefore, stepped back 16 centuries and lived again those days that have made such a page of history.

At the close of the demonstration the further improvement of the calendar that is contemplated at present was explained, an improvement which it seems almost certain will be adopted during this generation. There are sufficient serious difficulties with the present calendar that the inconvenience of a change is small compared with the advantages to ensue.

DOING TIME

By W. J. PASSINGHAM

(From *This Week*, weekly news magazine)

EVERY year, at the beginning of summer, an increasing segment of the civilized world observes "Daylight Saving Time." This annual juggling with the clocks never fails to result in a good deal of confusion. How many people, for example, without consulting the newspaper, know for certain whether the clock should be put "forward" or "backward" at the hour when D.S.T. is appointed to begin?

Mankind never has agreed—and, it seems, never will—upon the question of time and its measurements. Throughout all the ages of man, controversy has raged over the nebulous dimension called time. And is it true that since time had a beginning it must also have an end?

Let us go back down the Lane of Time, and trace its queer story through the centuries.

It is recorded that as long ago as 2269 B.C. two Chinese astronomers, named Hi and Ho, evolved a measurement of time we now recognize as a calendar. But the early Chinese calendar was evolved without much regard for the science of astronomy, and was in fact a Buddhist arrangement in which worship of ancestors and emperors and the anniversaries of Buddhism influenced the make-up of an astronomical year.

In India the calendar was evolved around the festivals and ancient rites of the Bedas, and divided into a 360-day year of 12 equal months. The Mexicans, when questioned by Cortez the Conqueror, declared that their god Quetzalcoatl presented them with their calendar on the day he breathed life into the first man.

Perhaps the most significant fact is that the primitive peoples of both the Old and New Worlds—in Africa, in South and North America, even in the Pacific Islands—all had some form of calendar, or measurement of time, centuries before the advent of Western civilization.

Now, since a calendar is an attempt to establish fixed relations between the day, the month and the year, and to measure the passage of time—when did time begin? It certainly did not begin with the Greeks, for not until Pythagoras had given impetus to the study of mathematics and an advanced knowledge of astronomy did the ancient Egyptian calendar become ridiculous in the minds of students. Although the famous Greek mathematicians, Meton and Euctemon, were joint authors of a calendar alleged to be superior to that of the Egyptians, and their names were inscribed in letters of gold on the Temple of Minerva as a reward, the Greek calendar reveals but little in the way of originality.

When did time begin? It is probable, almost certain, that man did not

create time until he ceased to be a mere hunter and settled down in a community to an agricultural life. Thus . . .

* * *

Behold the curtain rise on the gleaming, sun-lit waters of the mighty Euphrates, on whose banks has arisen a civilization which depends for its existence on the growing of crops—on seed-time and harvest in regular and unceasing succession. Babylon is told by her Wise Men that time has come to order life from henceforth, and the citizens sit at the feet of Wisdom to learn of this new thing come to confuse their minds.

"What is time? Tell us, wise one."

"Time, my son, is measurement, and man may measure this thing only by observing certain repeated motions. Apart from repeated motions, or pulsations, time cannot be measured."

"But how can this thing be done, wise one?"

"Thus!" The Babylonian seer points proudly to a queer new instrument at his side. "See the passing of time."

The seekers after wisdom stare at the first "clock," called a clepsydra, which was simply a graduated cylinder filled with water. As the water escaped through a small hole at the bottom of the cylinder its level fell and was recorded by marks, one below the other.

"Fill the cylinder, slave!" says the anxious seer, and a man renews the supply of water from his ewer. "Twelve times shall the clepsydra empty itself, from the rising of the sun to the setting thereof, and this shall be called a day."

* * *

The interval between sunrise and sunset came to be called the "natural" day to distinguish it from the "civil" day of 24 hours. But there were many conflicting ideas about the hour when the "civil" day should begin. Early records hold that the day began in the evening, because the Book of Genesis refers to "the evening and the morning" as composing a day. The Greeks adopted this same starting point, but the Roman day was altered to begin at 6 a.m., and for this reason Christ's death is reported to have taken place at the "ninth hour," which is generally recognized as being 3 o'clock in the afternoon.

From earliest times the length of a year was determined astronomically as 360 days, and records show that Egypt, Chaldea and China were all aware that somehow there were five days over. The Egyptians added these five extra days to a lunar calendar of 12 months with 30 days to each month, and gave the following explanation to the people:

"For Ra was angry with Nut, the sky-goddess, because of her intrigue with her brother Seb, the earth-god. Her punishment was that on no day of the year might she give birth to a child. But Thoth, the wise god who loved Nut, diced with the Moon and won from her a seventieth part

of her light, and out of this Thoth made five epagomenal days (the over and above days) belonging to no month and to no year. On these days Nut gave birth to Osiris, Set, Isis, Horus, and Maat . . ."

What to do with these five odd days has been a problem throughout the history of the human race down to modern times. A day is now recognized as representing the interval between two successive passages of a given celestial object across the meridian. Since the earth's rate of rotation is constant, it was argued that the length of a solar day must also be constant. Confusion on this point arises from the fact that the sun's progress is not constant, there being an opposing motion which differs to the extent of nearly one degree a day.

In 365 solar days the earth rotates 366 times. A journey round the earth from east to west, for example, will neutralize the sun's opposing motion, and the traveler will lose one day. On the other hand, during the same journey from west to east, each day is shortened and the traveler gains a day.

The problem is still further complicated by the fact that the sun's opposing motion is in itself an inconstant quantity. There is a variation in the length of a solar day that sometimes amounts to as much as 30 seconds. Only four times during the course of a year—on or about April 15, June 15, September 1 and December 24—do an accurate clock and a true sundial agree and coincide on the question of time.

These are the factors which baffled the ancient mathematicians, and which still intrigue their modern counterparts, who advocate what is now called calendar reform. The problem of time is as ancient as the human race, and it never fails to cause confusion when the subject is debated. Listen to the oration of the great Julius Caesar on this same problem, for his meddling with time gives him a place among the immortals:

"Much has changed since Romulus ruled and gave Rome its charter of time, for in Rome time now means wealth. Romulus ordained that there should be 10 lunar months in a year—Martius, Aprilis, Maius, Junius, Quintilis, Sextilis, September, October, November and December. What has happened since the passing of Romulus? Confusion. Confusion everywhere! The festivals of ancient Rome occur no longer at their appointed time, and are held to ridicule!

"Now I, Julius, will give you a new calendar, and restore order in Rome. Hearken! We must catch up with time. Let us add days to the months of January, February, and 67 more days will we add between the months of November and December."

"But, Caesar, think of the length of such a year!"

"I have consulted with Sosigenes, the mathematician, on the matter," Caesar continues loftily, "and this present year of ours must be lengthened to one of 445 days to catch up with time. It shall be known as 'The

Last Year of Confusion,' for all years to follow will be 365 days in length.

"I have spoken!"

And, having spoken, Julius Caesar unwittingly rang up the curtain not on "the last year of confusion," but on 48 years of error and correction before his clever scheme could be brought into full operation.

The Julian calendar was split up into month lengths of 31 and 30 days alternately, with the notable exception of February, which had only 29 days in common years and 30 days in leap years. From the very first, however, Julius Caesar's scheme was misunderstood, and one day was added in every third year instead of one in every fourth year. Thirty-seven years passed before this error was discovered and then leap year had to be cut out of the calendar from 8 B. C. to 8 A. D. so that time could be properly adjusted.

Sosigenes, the Alexandrian astronomer, was the real author of the Julian calendar. He decided that the true length of the solar year must be 365¼ days, and arranged his leap year accordingly. How near he was to the true figure may be judged from the fact that modern scientists hold the true length of a year to be 365 days, 5 hours, 48 minutes, 46.15 seconds. What Sosigenes did not know was that even the moon is not constant in her movements, and his estimate of month-lengths led him into error.

In any case, Sosigenes received little honor for his labor on the Julian calendar. The credit was accorded to Julius Caesar in 44 B. C. and the month of Quintilis was altered to July in his honor. In the year 8 B.C. Augustus sought immortality in the same way, by altering the month of Sextilis to August.

Only the passing of centuries of time revealed errors in Sosigenes' calculations. The Julian Year was 11 minutes and 14 seconds longer than the natural year, and not until 400 years later was it noticed that the seasons were becoming confused. Finally, in 1572, when Gregory XIII was installed in the Papal chair, a reform of the calendar had become a matter of international importance . . .

* * *

Pope Gregory surveyed the crowded audience chamber, and frowned. He realized that the present state of affairs could not continue. The seasons of sowing, harvest and fall were in confusion, even Holy Mother Church was affected by the dislocation of her festivals.

"We will begin at once," he decided reluctantly. "To alter time is a serious task, and it requires a scene of labor in keeping with its magnitude. Let us have the greatest mathematicians and astronomers of every nation in Rome. . . . Above all, send to me Aloysius Lilius, the Neapolitan physician. The world is 10 days ahead of time, and we must work quickly!"

In the year 1577, the Pope proclaimed his intention of altering time,

and in 1582 he issued a Papal Bull to all countries which recognized the spiritual authority of Rome. Gregory's calendar, for which Aloysius Lilius was mainly responsible, is still in use throughout the world today, and it is a correct measure of time in so far as man's ingenuity can make it.

England and the Protestant states of Germany refused to accept this calendar, but in 1700, on the urgent advice of the philosopher Leibnitz, Germany adopted the new system. England was content to remain behind on the question of time, using the old Julian calendar until . . .

September, of the year 1752—and all England is seething with indignation and excitement. Rumors are circulating throughout the country that the people are to be robbed of 11 days out of their lives! Several days elapsed before the British people understood just what was going to happen. England was now 11 days behind the rest of the world in time, and a bill was rushed through Parliament by Lord Chesterfield before the public had time to collect their wits. To rectify the error in the Julian calendar and bring the country into line with the rest of the world, 11 days between September 2 and September 14 were eliminated. And then the trouble began.

As the aged Duke of Newcastle, who had sponsored the new calendar bill, rode through the streets of London on September 2, 1752, the enraged population threw stones, garbage, anything they could find, at him.

"Give us back our eleven days!" roared outraged Englishmen. "Who stole our eleven days?"

It was generally agreed that the politicans had shortened the lives of all English people by 11 days, but what created greatest indignation was the fact that people were called upon to pay rent, taxes and dividends for 11 days which never existed. To aggravate the situation, an astrologer made a statement on Tower Hill that electrified a huge audience.

"Because of this infamy, this stealing away of men's lives," the astrologer declared, "the great oak tree of Malwood will not bud on Christmas Day as it has done for generations!"

Now, for more than a hundred years the great oak near Malwood Castle, Hampshire, had bloomed regularly on Christmas Day, a phenomenon regarded with awe by all good Englishmen. But on Christmas Day, 1752, the great oak of Malwood failed to bud, and the wickedness of the new calendar bill was placed beyond question. In vain people stormed about the lost 11 days, for these were gone beyond recall and the loss was soon forgotten. A century and a half passed away, and then . . .

* * *

There lived in London, about the year 1905, a builder named William Willett, a contented craftsman untouched by fame or any great good fortune until he undertook a journey to South Africa. When William Willett returned from South Africa with vivid memories of that country's

brilliant sunshine he appeared to be a changed man. He was obsessed with a desire for the sunshine and long day he had enjoyed in South Africa, and his opinions about time at first startled his acquaintances. They were amazed when he found courage to hire public halls and lecture on the subject of daylight.

"There's something wrong with Willett," they said. "He's a good fellow, but a bit queer in the head. Sunstroke in South Africa, you know."

But it was a love and desire for sunshine rather than a case of sunstroke with William Willett. He talked of the young people who worked all through the day indoors, and who came out into the fresh air only when sunshine and daylight were failing. Then he put forward a detailed scheme which completely mystified his listeners. For what William Willett wanted to do was steal an hour of daylight from Father Time.

The opposition to this new experiment with time was at first tremendous. People argued that what Willett proposed was against Nature. They pointed out that only a lunatic would try to alter the sun and moon in their courses. Besides, what would the farmers do?

"Come and tell my cows to alter their milking time," one farmer invited, and William Willett declined the offer.

He continued to lecture up and down the country until at last the truth he uttered was forced home on thousands of adherents. In 1907, a bill for saving daylight was brought before Parliament, and, in spite of Willett's argument that the scheme would save £2,000,000 yearly in London alone by reducing the cost of artificial light, the bill was rejected. The Germans listened to William Willett with far greater understanding, however, and they were the first nation to adopt his scheme and operate it with marked success. Other European countries quickly followed this lead, until the British Parliament was forced to pass the Daylight Saving Bill.

In 1915 this robber of time lay dying, but before he died he learned that at long last his great scheme would be adopted in his own country. There is no statue to honor the memory of William Willett, and few people indeed know that he is responsible for the long hours of daylight they enjoy in Daylight Saving Time. At least, he is worthy of a place in your thoughts, this man who stole sunshine for the young folk, when you put your clock "backward"—or is it "forward"?

* * *

Those who would experiment with time are still with us. Their object is a fixed calendar operated through the world, which they say, would be of enormous benefit to mankind.

The advantages of this scheme are very plain, because all modern reckoning would be simplified.

WOMEN'S CLUB ACTIVITIES

By Mrs. Rowland H. Latham

Chairman of the Calendar Reform Committee of the General Federation of Women's Clubs

At the latest triennial meeting of the General Federation of Women's Clubs, held in Kansas City, Dr. Clara B. Burdette, Chairman of the Historical and Continuation Committee of the Federation, made the following recommendation regarding calendar reform based on Mrs. Latham's official report, which is printed below: "If it is the duty of this Committee on Continuation to suggest the promotion in the General Federation of such policies and course of action as shall give to the Federation greater vitality, strength, endurance and power, we recommend: The continuation of the study of calendar reform. Under the committee appointed to bring information concerning the proposed World Calendar, you have already been presented with the facts concerning waste of time, efficiency, commercial cost and mental reckoning that could be eliminated by the acceptance of this reform, and we emphasize its importance."

AT THE close of the Tulsa Council last spring a request came to the General Federation of Women's Clubs from The World Calendar Association asking cooperation in the endorsement of calendar revision. Mrs. Lawson, the President, assigned to me the task of investigating the movement and at this time I shall combine a report of what has been done by club women of the General Federation with the changes that are involved in the proposed calendar itself.

Having had a definite interest in calendar revision for some time, it was at once evident that a question which had received favorable action by such organizations as the League of Nations, the International Chamber of Commerce, the National Education Association, the National Grange, the Pan-American Conference, the United States Statistical Board, the Universal Christian Council, international labor bodies, governing bodies of the Episcopal, Lutheran and Presbyterian Churches and others, was of sufficient importance to warrant a study by this great body of club women. Acting on this belief, permission was received from our President to set in motion such a study. Letters were sent to all State Presidents asking for publicity through their state magazines and also offering material for helps on club programs devoted to calendar reform.

The year's study has shown unexpected interest in this question and has made the Federation "calendar-conscious"—conscious of the fact that our 350-year old Gregorian calendar is no longer a stable time system, but a "wandering minstrel" among the products of our civilization. A revised calendar would eliminate the hardships resulting from this instability and would meet the needs of all people, nations, races and vocations.

The General Federation observes faithfully a policy developed through

the years to study all sides of a question before taking action, and yet in offering this plan of The World Calendar I am offering the only scheme for calendar revision which has survived elimination after more than 200 models have been submitted. It is the only one to receive favorable action by the League of Nations and the only one which today is receiving serious consideration. A 13-month calendar, promulgated some years ago, is now definitely out of the picture because the insertion of a 13th month between June and July involves such a change as to be revolutionary in its effect.

The outstanding features of The World Calendar are as follows: The proposed calendar will be a perpetual one; all years will be alike and will begin on Sunday; no hunting of future dates will be needed because corresponding months and days will be forever the same, from year to year. All quarters will be equal, having 91 days, with 26 working days in each month. Each quarter will begin on Sunday and end on Saturday. This equality of quarters and months strongly appeals to business as an aid in studying, planning, and comparing budgets and other data.

The necessary extra day every year to maintain a 365-day year will be placed after December 30th and will be called Year-End Day. In the same way, the extra day which we now add every four years will be placed after June 30th and will be called Leap-Year Day. These days will recur again and again and will no doubt be observed by nations as international holidays.

The world is fast moving toward week-end holidays. In June, 1937, Senator Johnson of Colorado introduced a bill into the United States Senate which provided that certain legal holidays be observed on the nearest Monday instead of on their original dates. This was done to afford more week-end holidays which are approved by business and labor alike because they do not disrupt the continuity of the working week. Similar bills have been introduced in the legislatures of New York and New Jersey. The World Calendar lends itself well to this plan of week-end holidays. For instance, Armistice Day would always fall on Saturday; Christmas Day on Monday; Lincoln's Birthday on Sunday; and if we return to the original date of Washington's birth—February 11th—which is the date he always observed and which is Saturday in The World Calendar, we would have a week-end dedicated to two great Americans—Washington and Lincoln.

A stabilized Easter is one of the main reasons for calendar reform. Easter now wanders over a margin of 35 days—from March 22d to April 25th. Department stores, clothing and hat manufacturers, textile industries, florists and educational institutions have combined to ask that a definite date be determined for Easter. Since this is primarily a religious festival, any date for making it permanent would have to be agreed upon by the churches.

In the international realm, support and activity are not lacking. Swit-

zerland, following its usual tradition of working for international cooperation, led off in 1913 for a revised calendar. Its plans were disrupted by the World War, but after the war the Swiss Government asked the League of Nations to take up the movement and since 1913 the League's offices in Geneva have been the center of action for calendar revision. After 10 years of investigation and promotion, the League submitted to all nations a draft treaty for the enactment of the reform.

England is the pioneer in the campaign for a stabilized Easter. The attitudes of France, Germany, Italy, Pan-American nations, Japan and China are also favorable.

Among the trades and professions, James Truslow Adams comes out strongly as spokesman for historians in urging the adoption of The World Calendar; George Gordon Battle for the law profession; the late H. Parker Willis, of the School of Banking at Columbia University, urged calendar reform in the name of the financial world; G. S. Wrong, the Canadian statistician, speaks for his group; Herbert B. Nichols, science editor of the *Christian Science Monitor,* represents the scientific world; while others equally prominent in the realm of accounting, journalism, electric manufacturing, retail trade, transportation, engineering, agriculture, hotels, advertising and printing might be quoted in favor of the movement.

Some of the strongest supporters are to be found in the religious world. The Catholic Church has produced some of the most profound authorities on this subject and the Vatican has emphatically stated that there is no dogmatic objection to a stabilized Easter or to the reform itself. The Executive Secretary of the Universal Christian Council terms the movement of the utmost importance and says that his body has already taken favorable action. The Greek and French churches stand back of this new calendar, as do the churches of Asia. From far-off India, Mahatma Gandhi says, "I am in favor of such a calendar. I am in favor of a standardized calendar for the whole world." The Church of England is represented by the Archbishop of Canterbury, who says: "Constitutionally, I have a great dislike of any proposal to change long and well-established customs unless there is a very strong reason. But I am bound to say that I have found it impossible to resist the plea for reform in this matter, which comes, I think, from the representatives of all the great organizations of trade, industry and commerce throughout the civilized world. I think it would be a real misfortune if this matter were allowed to drift." Several learned Jewish rabbis have contributed important articles on the subject of The World Calendar, among them being Rabbi Martin Weitz, former Director of the Hillel Foundation at Northwestern University; Dr. Arthur A. Feldman, of Hamilton, Ontario, and others.

The subject of calendar revision was presented at the last meeting of the Board of Directors of the General Federation by Miss Elisabeth Ache-

lis, President of The World Calendar Association, herself the author of an outstanding book on the history of the calendar. This address, and another which Miss Achelis delivered in Budapest during International Women's Week last August, are available to club women who wish them. Our department of Research and Club Service at Headquarters has cooperated in distributing literature to clubs throughout the country and with the permission of those in authority in order that an opportunity for presenting the question may be given those clubs whose programs were completed before this study was fully launched last fall.

Letters from many club leaders disclose the fact that the possibility of calendar revision's becoming a factor for international understanding and cooperation forms the basis of its strongest appeal to club women. With no national prejudice or political issue involved and with no special interests concerned, it would seem that all peoples everywhere could unite amicably to bring about this reform. If it should prove to be an effective weapon for world peace, no sacrifice of time or energy could be regarded as too great to accomplish it.

Any club wishing to undertake the study will be furnished all necessary material and we will be happy to have you join those groups who are finding it an intriguing subject.

OBITUARY NOTES

ARCHBISHOP CHRYSOSTOMOS of Athens, Primate of the Greek Church, died on October 22, of heart disease. He was born in Thrace and studied at Athens, Kieff and St. Petersburg, becoming Professor of Theology at the Church College in Jerusalem before returning to Greece in 1911, when he was elected Primate of Greece. He was 69 years old. During the past ten years he had written frequently and extensively in support of calendar reform, and an abstract of his most extensive monograph on this subject was published in the *Journal of Calendar Reform* in the issue of December, 1935. He graciously received the President of The World Calendar Association during her visit in Athens in 1934.

CHARLES E. DURYEA, sometimes called the "father of the automobile," died on September 28th in Philadelphia. Not the inventor of the first gasoline automobile, he had the rare mechanical genius to see how the invention of his predecessors could be combined into a sound invention. A member of The World Calendar Association since 1934, he devoted a good part of his later years to the advocacy of The World Calendar. He interested hundreds of people and was instrumental in adding many new members to The World Calendar Association.

CHARLES FREDERICK SCOTT, publisher of the Iola (Kan.) *Register*, and a member of the Kansas Legislature, died on September 18th, at Iola, Kansas. A member of The World Calendar Association for several years, he constantly brought this reform to the attention of the public through the columns of his newspaper.

OTHER deaths among the membership of The World Calendar Association during the past few months include: *Andrew J. Maloney*, industrialist, Philadelphia; *Dietrick Lamade*, publisher, Williamsport, Pa.; *Dr. Stanley Rossiter Benedict*, Cornell University Medical College; *Hon. William H. Thompson*, former U. S. Senator from Nebraska; *Rev. Dr. John Campbell*, New York City; *Rev. Dr. Sydney Goodman*, Philadelphia; *Rev. John Holah*, Doylestown, Pa.

SEVENFOLD FORMULA

By P. W. Wilson

I AM one who believes that the setting apart of one day in seven for rest, reverence and recreation has been of incalculable benefit to the well-being of mankind. The defense of this seventh day against any kind of encroachment is an obligation laid upon every responsible citizen. I am unable to agree, however, that The World Calendar infringes on this great principle. Once during every ordinary year and twice in every leap year the benefit of the weekly rest-day is doubled by the addition of what in scriptural language would be called a second Sabbath. This is in strict similarity to the Jewish practice of observing the New Year on two successive days, a practice extended in the Jewish calendar to other festivals. Thus an ancient Jewish custom of a 48-hour instead of a 24-hour day would be revived. In all countries such a holiday has been regarded as a measure of industrial emancipation, strictly in line with the demand of Moses the Lawgiver when he insisted upon Pharaoh granting three days of freedom from labor—in effect the long week-end—to the oppressed Israelites. (Exodus 8:27.)

I have heard it suggested that a reason for refusing this additional Sabbath or day of rest to the people is that they would not know how to use it to spiritual and cultural advantage. It would scarcely be possible to formulate a more fallacious argument. It is no different in logic from the plea that slaves should be kept in servitude because they will not be able to live usefully in freedom. There is no way of teaching people how to make the best use of their rights except granting the rights. The larger opportunity for personal liberty afforded by The World Calendar is not wrongful merely because many people have still to learn how to make use of liberty.

It is suggested that The World Calendar sacrifices one seventh day in every seven years. That is merely a technical demurrer to the reform, for during the seven years there will be added either eight or nine rest-days, every one of which will immediately follow a seventh day. In terms of human benefit, the whole of which is emphasized in the Bible—worship, fresh air, change of occupation, family reunion, health—the gain will be absolute and the loss will be nil.

There remains the mystical argument based upon the belief that there is something sacred and untouchable about an unbroken succession of seven-day weeks. In China a period of four such weeks or 28 days has been continuous for thousands of years—a fairly long experiment in social and spiritual advantage. No friend of China thinks that this technical continuity has been of essential service to the age-long civilization

of that country. The continuity has not proved to be any safeguard of Chinese civilization, and I am wholly unconvinced that religion in the west can be upheld against secular influences by insistence on a similar arithmetical formula.

It so happens that I approach this question from the Christian standpoint. I appeal therefore to the authority of Scripture including the recorded utterances of Christ. The command to remember the Sabbath Day and keep it holy was never interpreted by the Church as meaning the seventh day, namely Saturday. The Church changed the rest-day from Saturday to Sunday causing the day of worship in that instance to fall on the eighth day and thereby deliberately broke the seven-diurnal continuity. Also the Church changed the hours on which the rest-day begins and ends. The Jewish Sabbath is from sundown to sunrise. The Christian Sunday is from midnight to midnight.

Christians have always held that these changes were justified by the words of Our Lord Who, during His ministry, was repeatedly attacked on grounds identical with the criticisms in this regard of The World Calendar. Jesus stated that the Sabbath or rest-day was made for man, not man for the Sabbath (Mark 2: 27-28) and the Son of man—that is the complete manhood of the race—is Lord also of the Sabbath. In the same Biblical Book we are told how Jesus warned His people against too great a traditionalism thereby losing the spiritual value of the law and word of God.

Our Lord emphasized the distinction between the Law of God and tradition of men by progressive statements that cumulatively are of great significance—"The tradition of the Elders"—"The tradition of men"—"Your own tradition"—"Your tradition"—(Mark 7:5-13).

It must be remembered that the word Sabbath does not include or imply the numeral seven.

There is strong authority in scholarship to support the view that originally the Sabbath marked irregular intervals within the month and that the regular weekly occurrence developed later.

In the Hebrew calendar any day of rest or indeed any period of tranquility was called Sabbath. For instance, the passage—"there remaineth, therefore, a rest unto the people of God" (Hebrews 4:9)—is in the original Greek, "there remaineth, therefore, a Sabbath unto the people of God."

In the prophecy of Isaiah (1:13) the Jewish people were warned against spiritual dependence on new moons and Sabbaths. This warning was repeated by St. Paul in his Epistle to the Colossians (2: 16, 17). "Let no man therefore judge you in meat, or in drink, or in respect of an holy day, or of the new moon, or of the sabbath days: Which are a shadow of things to come; but the body is of Christ."

In view of the decision of the Church which adopted the first instead of the seventh day as the day of rest, necessitating one weekly cycle of eight days for worship, and of plain declarations appearing in Hebrew prophecy, the Christian Gospels and a Pauline Epistle, I am unable myself to accept the judgment of those who, as it seems to me, oppose these pronouncements on their own authority. Not that I would presume to express a merely individual view. I am trying to state the attitude of many responsible authorities within the Roman Catholic, Eastern Orthodox, Angelican and Protestant Churches who approve The World Calendar.

We are living in days of world-wide transition. Every custom and tradition is tried as by fire and little endures except the essentials. Materialism goes into battle against the spiritual with modern weapons of every kind. The spiritual in its conflict with the material ought not to be represented by munitions that were described by St. Paul as "wood, hay, stubble." The armaments of the Christian soldier were not thus organized. His helmet of salvation, his sword of the spirit, his breastplate of righteousness, his shield of faith, his girdle of good-will, his feet shod with the preparation of the gospel of peace are all universal in their appeal to the noblest in our race. Thus accoutered, man can win his battle for the more abundant life.

They who have followed the movement in favor of calendar reform are impressed more and more, as months go by, with its importance as an expression of the universal mind within the human race. The simple and scientific measurement of time throughout the world which turns on its axis at the same speed of rotation for everybody who dwells upon this planet is, in itself, a symbol of reconciliation. It is proof that people of good-will—despite racial, religious and cultural differences—can act together for the greater benefit of the greatest number. As there are people of every faith and of no faith endeavoring to ameliorate differences between communities which no longer have a common basis in logic or social advantage, it is not for those who profess and call themselves Christians, to overemphasize the importance of incidental adjustments without which no reform can be effected.

The observance of a weekly rest-day leaves much to be desired. That also can be said of life as a whole. The idea that a revival of faith will be affected, one way or another, by an increase in the number of rest-days, however they be arranged in the week, is however fantastic. At any rate this idea lies wholly outside the profound mystery of love which surrounds what according to the Christian faith was the Incarnation, which mystery is revealed in parables and miracles, in epistles and discourses, in the Cross of Christ and His empty tomb—I write as a Christian—where the sevenfold formula is never mentioned even by inference.

WHY SO LONG DELAYED?

By F. S. MARVIN

Fellow of the Royal Historical Society

(From *The Contemporary Review*)

The author speaks with the authority of an historian and educationalist as well as that of a man of affairs. He is a Master of Arts of Oxford University, a distinguished author, sociologist and philosopher. Until 1924 he was Staff Inspector of the Board of Education, where his main duty lay in teaching teachers how to teach. This task he has accomplished with great distinction and he is one of the pioneers of the "courses for teachers" movement. In 1929-30 he was Professor of Modern History at the University of Egypt. He is listed as the author of eight books, and the editor of eight others, on European history, politics and sociology.

REFORM of the calendar is a question which has exercised the mind of man for more centuries than we know. It is of unique interest because it combines some of the most profound and infinite thoughts of our nature with the necessities of our daily life. In measuring time, which man began to do as soon as he began to be rational, he was in touch from the first with those notions of a continuum and an infinite process which still elude him and will elude to the end of time. And yet, also from the first, he was aware of a regular beat in this infinite process by which he was compelled to order his life. He slept regularly, and his sleep coincided with the regular alternation of light and darkness, which is the most obvious parcelling up of time, imposed on all living things. From the first, therefore, we have those two inextricable elements in the measurement of time, the subjective sense of duration, by which alone time seems to exist, and the objective signals, things happening outside us, without our control, and by which this conscious duration is ordered and divided up. The calendar is the arrangement, gradually arrived at, by which these external happenings are fitted into an agreed scheme by which more and more men arrange their lives.

The happenings are external, the arrangement is conscious, deliberate and—within those external limitations—capable of indefinite alteration and improvement. This fact makes the history of the calendar of surpassing interest, as being the best example of the collective good sense of mankind in grappling with a problem imposed from without and common to all the inhabitants of the globe. It should give us courage and fresh hope in facing other problems in which the collective good sense of mankind is not so apparent. They have come to increasing agreement about this most intricate problem, an agreement which overrides all differences of religion or race or country. In other matters, not so intricate and

equally common to all, we may reasonably expect a convergent unanimity.

Ultimately the calendar which established itself in the world was a solar one. If one thinks for a moment it is clear that this was bound to be so, because the two chief motions of our earthly home in relation to other celestial bodies both relate to the sun. By turning round on its axis the earth exposes half its surface to the sun at a time, and the change of this half and its return to the same position every 24 hours give us the day and the night. By its motion round the sun in about 365¼ of these daily revolutions, we have the year, with its changing seasons due to the fact that the earth's axis being inclined to the plane of its orbit of revolution, different parts of the surface receive at different periods of the year different amounts of the direct rays of the sun.

The sun is in fact the undisputed sovereign of our earthly life, for by his light and heat distributed to us according to our distance from him and varying according to these two movements, we live and move and have our being. Yet our earliest ancestors on the planet did not reason in this obvious way in framing their first calendar.

The calendar is so called from the Roman name for the first day of each month and the month is itself a lunar period. Month is moon-th, or at least comes from the same root, and tells us that when men first began to reckon time, they followed the revolutions of the moon round the earth and not those of the earth round the sun. We know now of course that the influence of the moon upon our lives is insignificant compared with that of the sun, but to our forefathers it was not so apparent. They could study the moon more closely. Her face was more gracious and her phases more interesting. Hence, in early religions and astrology, the moon plays a larger part than the sun, and we shall probably carry down a division of the year into months to the end of time.

But the month, as we now speak of it in a calendar sense, has drifted away entirely from its old moorings. The first calendar-makers everywhere started with a month, which meant the period from one new moon to another, and this new moon has still a calendar-value in certain rather eccentric cases, e.g. in fixing Ramadan or Easter. But for the main framework of the calendar it was discarded first by the Egyptians and then by the Romans. The mean value of the moon's revolution round the earth is 29 days 12 hours 44 minutes and 2.7 seconds, a period practically impossible to fit into the solar year of 365¼ days. Hence, while keeping the name with its ancient and romantic associations, the Western world, in this and so much else showing the way to the rest of mankind, has been for many centuries content with a month which is an easier quotient of a year. It happens to be somewhere near the length of the lunar month and it happens also to contain a little more than four of the seven-day weeks of which something must be said in a moment.

But for an accurate and useful calendar men have concentrated now for some millennia on fitting the days into the year, i.e. the smaller of our two main periods into the larger. Three great civilizing agencies have done most in this work and thereby shown their fitness for leadership in the world—the Egyptians, the Romans and the Catholic Church.

The Egyptians, quite early, rejected the Babylonian attempt to fit the lunar revolutions into the solar year as a basis of their calendar. They adopted the solar year

as the basis, dividing it up in what seemed to them the most convenient way. This was 12 equal months of 30 days, leaving them with five extra days each year which were allotted as Holy Days to five Great Gods. Thus Osiris, Horus, Set, Isis and Nephthys each gained a birthday, making up a total of 365 days for the year.

It was a capital step, anticipating our own calendar and in one respect superior to ours, for their months were equal. But in one point it was defective, for the exact year is not 365, but 365 days, 5 hours 48 minutes 46 seconds. Hence about every four years a fresh adjustment would be needed, and this is in fact what Julius Cæsar, having taken over the Egyptian calendar, did, on the advice of Sosigenes, an Alexandrian Greek, in the year 45 B.C. By that time the discrepancy had become so great that Julius ordained in 46 B.C. a year of 445 days to work off the surplus which had accumulated.

It was known as the year of confusion, being properly the *last* year of a confusion which had long prevailed. The new year of the Julian system was to begin on the first of January, 45 B.C., and the alternate months, January, March, May, July, September and November, were to consist of 31 days, with intervening months of 30. Only February was to have 29, with an extra day every fourth year to make up roughly the discrepancy in hours. This roughness had again to be smoothed out by the Gregorian revision; but, before that came, Augustus had further spoilt the Julian regularity by giving himself a special month—August—which had to have the maximum number of days, viz. 31. So a day was filched from February, and some other irregularities were introduced.

The Julian year was from the first too long, as the Egyptian had been too short. Calling it 365¼ days, made it 11 minutes 12 seconds more than the true length, and, as Hipparchus had worked out the length to within 4 minutes of the truth more than a century before, Cæsar, or at any rate Sosigenes, must have known it quite well. They were content to leave the smaller problem for posterity, while they got rid of their own gross irregularity first. The smaller error bound Western Europe for sixteen and Eastern Europe for nearly twenty centuries. In 1582, when Pope Gregory XIII, on the advice of a fresh set of astronomers, made the calendar by which we still live, the error had mounted up to ten days. This time the days were in excess as Julius had reckoned the year too long. Ten days were struck out, in England not till 1752, when there were riots in various places at the loss of 11 days, and, as the rioters declared, of their wages. This last revision has brought days and years into such an accurate relationship that discrepancy will only be noticeable in some three or four thousand years. As every one knows, we have by Gregorian order an extra or Leap Year day once in every four, except in the last year of each century when there is only a Leap Year once in four centuries. When the last year of the century is exactly divisible by 400, it is a Leap Year; otherwise not. 1700, 1800, 1900 were not Leap Years, but 2000 will be.

If then the present calendar is so close an approximation to the truth, what need is there of further change? Why does a former member of Parliament write a fascinating and persuasive book, telling us all about the past, but leading up with special zest to plans for the future?

Many conservative minds do in fact think like that. Others are more struck with the things that might be reformed than apparently are the reformers themselves. Think of the traditional names of the months and the days of the week! Are men to be content for all time to go on calling the months and days by names which mean nothing to nine-tenths of those who use them, and to the minority are a quaint amalgam of Roman and Teutonic imperialism and mythology? The names of the days of the week are planetary, being either Latin or substituted Teutonic or Norse, dating from somewhere about the beginning of the Christian Era. The names of the months are all Latin and show the mixture of imperial vanity, Roman mythology and simple enumeration of which an example was given above. Men have often asked themselves whether this was suited to a modern and scientific age and proposed alternatives. The leaders of the French Convention did so, with a 10-day week and months called after the leading notes of the season—Nivose, Pluviose, etc. This disappeared in the reaction under Napoleon.

Half a century later, a far more thorough scheme was put forward by Auguste Comte on an historical basis, which still has its supporters, especially in the United States, quite apart from the religious Positivists to whom it primarily appeals. It divides the year equally into 13 months of 28 days, with four seven-day weeks in each. The months, weeks and days are all named after eminent men who have contributed to build up the civilization of mankind. They are arranged chronologically and according to the nature of their contribution, the most important being taken for the months and the lesser for the weeks and days. Thus the day on which this article is being written, is the day of Voltaire, in the week of Corneille, in the month of Shakespeare who stands for "The Modern Drama." For common use of course it would be known simply as the 11th day of Shakespeare, but the subsidiary names, with their artistic, scientific or political memories, have been found of great educational value ever since by a large number of persons who would by no means subscribe to the religious or philosophical tenets of the calendar-maker. Knowing this, Frederic Harrison, some 40 years ago, with the aid of a band of sympathetic scholars, prepared an illustrative volume called the *New Calendar of Great Men* which may still be had and is for many reasons preferable to most biographical dictionaries.

Comte's calendar left over an odd day every year and the usual extra odd day in Leap Year. These he proposed to make, the former a festival called after and commemorating "All the Dead," the latter—the Leap Year day—a "Festival of Holy Women." One sees at once the attractiveness and the stimulus of the scheme, but unfortunately it has two grave practical defects which have barred it from acceptance. It destroys the even half-year of six months and it prevents the attainment of even quarters of three months each. Now these two things, from the business and statistical points of view, are of the first importance and no calendar reform which omitted them—still less one which made them more confused than before—would have a moment's chance of success.

The present calendar reformers take the most modest and conservative position which any reforming body ever took. They retain the 12 months, with all their odd traditional names. In order to gain the maximum of regularity with the minimum of change, the length of the 12 months is rearranged so as to give in each quarter, first a month with 31 days and then two months with 30 each. Thus:

Jan. 31 days	Apr. 31 days	July 31 days	Oct. 31 days
Feb. 30	May 30	Aug. 30	Nov. 30
Mar. 30	June 30	Sept. 30	Dec. 30

It is claimed, and quite truly, that this proposed change would cause less dislocation in men's habits or the business of the world than either the

Julian addition of two months or the Gregorian cut of 11 days, and the gain in uniformity and order which would result is beyond comparison greater. The year would become uniform, always beginning with a Sunday. In every year the same day of the month would fall on the same day of the week. Although the months would differ among themselves to the extent of one day, that is the minimum difference compatible with an arrangement into 12 months of our sun-given year. And for many practical purposes—the paying of wages for instance—the months would be equal, for the longer ones would contain five Sundays and the shorter only four. The odd day, which is left over at the end of the year, would become a public holiday—the Year-End Day—while those who wished to give it a religious tone, would be at full liberty to persuade their fellow-citizens to do the same. The Leap-Year Day might become in its turn an extra holiday at the end or in the middle of the year.

Was ever so small and beneficent a change so long delayed or so much debated? It will come of course; and some day, if not a fresh naming of months or days, at least some generally accepted festival-days for all nations, as Comte had in mind for his calendar. Because it will be observed that, in spite of the immediate delay, there is a growing unanimity of mankind on the subject.

Calendar reform which would increase the unity of mankind only suffers from its being so obvious and comparatively dull. The reform is obvious but the story which leads up to it is the least dull in the world for any one interested—as all must be if their minds are open—in the gradual conquest by the human spirit of the many complex difficulties of nature. By this conquest we have all grown to man's estate, and no part of the onward march is marked by more interesting milestones than the history of the calendar.

Of all the features calling for reform none has been more canvassed than the question of a fixed Easter, not yet mentioned here. This still remains more in the province of His Holiness in Rome than of any other man or body of men, and he has pronounced that the Vatican has no objection to the reform. Four hundred years ago the last reform of the calendar as a whole was carried out for all nations by the Pope. Now he is asked only for his approval of the distinctly religious part of the new programme. The general question, like the assignment of continents or the laws of marriage or of deduction, has passed to other hands. Are these new hands to prove feebler and less effective than the old hands of a religious body, compact though limited, conservative in the main but ready to move on clear reason given? In this case clear reason has been given, and the Pope for his part has shown that he is willing to move. Is a temporal League of Nations to show less consciousness of the needs of men. and less capacity to meet them, than the ancient Spiritual Power?

NOTABLE ITALIAN BOOK

Reviewed by The Rev. Edward S. Schwegler, D.D.

BREVI CENNI STORICI INTORNO AL NOSTRO CALENDARIO CIVILE E PROPOSTA DI SEMPLIFICAZIONE DELLA SUA FORMA. G. B. Lacchini. Estratto dall'Annuario 1938 dell'Osservatorio Astronomico di Trieste. Trieste, 1938. (Short Historical Sketch of our Civil Calendar and Proposed Simplification of its Form. By G. B. Lacchini. Reprinted from the 1938 Annual of the Astronomical Observatory of Trieste.)

THIS author, M. Lacchini, is to be congratulated on a very solid, succinct and scholarly piece of writing. He is an astronomer at the Royal Astronomical Observatory of Trieste, and the essay first appeared in the 1938 *Annual* of that institution.

The treatise is valuable particularly for its outline of the Roman calendar, which is the foundation of our own. The author insists on a number of things that popular writers on the subject often disregard, or greatly distort. Thus, we are reminded that the original form of the Roman calendar, the so-called Calendar of Romulus, is only very vaguely known to us, since the knowledge we have of it comes from writers who lived five centuries after the supposed times of Romulus. Again, we are told that the Julian length of the year—365¼ days—was known in Italy three or four centuries before Julius Caesar, and was not, as so many writers would make it, a sort of prodigy fallen straight out of heaven. It is also satisfying to find insistence on the fact that Caesar's edict, establishing the Julian reform, is lost.

Above all, however, the informed student of the calendar must rejoice to come upon a flat rejection of a fairy tale that has long adorned popular histories of the calendar. This is the story that Caesar Augustus, on the occasion of correcting the erroneous application of Caesar's leap-year rule, "stole" a day from February, which is supposed to have had 29 days in the Julian reform, and gave the booty to his own month, August, up to that time only 30 days in length.

It is astonishing how this interesting piece of fiction pops up with the utmost regularity. It has been told many times in popularly written articles. And it is to be found in a number of otherwise reliable books. It is accepted, for example, in Philip's *The Calendar* (Cambridge, 1921), in one of the Harvard Engineering School's publications (1934-35)—Kennelly's *Proposed Reform of the Gregorian Calendar*—and in Chauve-Bertrand's *La Question de Pâques et du Calendrier*. (Paris, 1936). The authority for this story of the stolen day is so tenuous that no serious student can accept it. Says Lacchini: ". . . It cannot be proved that a day was taken from February and given to August. Historians are unanimous in holding that

the days of the month as we now have them were established by Julius Caesar, and there is no document to prove the contrary."

In discussing the Gregorian reform, the author dwells upon the exact length of the tropical year in detail, as might be expected from an astronomer; but he concludes very practically about the slight error in the Gregorian year: "A day's difference, so far in the future, is not something to worry about in a calendar that regulates everyday life here and now, and therefore the Gregorian calendar, as regards the length it gives the year and consequently the system of intercalation, may be left alone."

Some practical tables for the ascertaining of the Dominical Letter and a favorable discussion of The World Calendar conclude the brochure.

It is interesting to see ourselves in the eyes of others. We English-speaking folk will find that we are perhaps a slight source of scandal to M. Lacchini; for, whilst the Italians know Saturday and Sunday by the more Christian designations of *Sabato* and *Domenica*, there are still a few heathen parts of the world where these days are called after the pagan gods Saturn and the Sun—*come lo sono ancora per gli inglesi!* On the other hand, our writer is not quite up to date when he says that the 13-month plan of reform has many champions—*molti fautori*—in the United States. For several years now the proponents of the 13-month plan have been conspicuous by their silence.

Here and there, despite the general excellence of his brochure, one may take exception to Lacchini. To argue against the calendar of Romulus on the ground that an agricultural people could not use a calendar of ten months goes against the facts. It is precisely agricultural peoples who *have* used such calendars: and such peoples do not count in the extra two months necessary for the tropical year because two winter months have no significance for agriculture.

For the thesis that February originally followed December in the Roman calendar and so ended the year, there is but doubtful authority. The only real reference is in Ovid. Testimony to the contrary is of such weight that one can hardly call the thesis even "seemingly certain"—*(sembra accertato)*.

It is also a bit arbitrary to say that the word *Ides* of the Roman calendar is derived from the Greek, *eidos*, form, figure, without mentioning a much more satisfactory derivation from the old verb *iduare*, to divide: the Ides dividing the lunar month into two halves. And it does not quite seem "very difficult to decide"—*assai difficile stabilire*—what caused the Roman priests to make their notorious error of intercalation whereby they inserted Caesar's extra day every three instead of every four years. It is well known that the Romans counted both ends of a series, and the conjecture seems very well founded that the original decree of Caesar posited an extra day *quarto quoque anno*, every fourth year. Indeed, the author,

on the same page where he finds it so difficult to explain the error of the priests, points out that the *nundinae,* from *novem,* nine, were actually a period of eight days, and that "every nine days" for the Romans would mean for us "every eight days." So similarly, in all probability, the priests interpreted "every fourth year" to be our "every three years."

Any discussion of the week and its history will naturally depend upon one's system of biblical exegesis. Lacchini lines up with later schools of thought when he states that the week cannot be traced in history farther back than the tenth century before Christ. But in any system of exegesis it ought to be clear that the origin of the uninterrupted week as we have it is Jewish: an historical development that it seems impossible to deny. Yet our author equivalently says that this cannot be asserted, or at least cannot be proved.

One of those odd side-lights that make the study of the calendar so interesting is brought out by Lacchini in a footnote. The date of the Gregorian Reform is universally set down as 1582, as also of the papal bull *Inter gravissimas,* which inaugurated it. As a matter of fact, however, the bull was dated February 24, 1581, because in Rome at that time the year still began on March 25.

M. Lacchini brings out a point of special interest for Italians. In The World Calendar almost all of the great Italian civil holidays come on Saturdays. Among them are: February 11, Conciliation between Church and State; March 23, Fascist Anniversary; April 21, "Birthday" of Rome; November 4, World War Victory; November 11, King-Emperor's Birthday.

The corresponding incidence of American holidays includes: Lincoln's birthday, which falls on Sunday and according to current custom would be observed on the following day; Christmas Day, which would always fall on Monday; Armistice Day, falling on Saturday; New Year's Day, Sunday; Inauguration Day, every four years, on Friday. St. Patrick's Day would be a Sunday holiday.

The World Calendar is fortunate in having so worthy a champion as M. Lacchini in Italy. Besides the brochure under discussion, he has contributed articles to different publications, as *L'Astrologo* (Trieste, 1938, p. 63) and *Sapere* (Rome, April 15, 1937, p. 234). If The World Calendar is to be more widely known, it needs just such men as Lacchini in the different countries of the world—men who know their subject and who can explain it to their compatriots in their own language and according to their own ideologies. And it is heartening to have a scholar of M. Lacchini's calibre accept unequivocally the one scheme of reform upon which the greatest number of people is agreed and which has the greatest possibility of eventual acceptance. Too often those who write on calendar reform ignore the importance of unified action and insist upon elaborating a plan all their own.

TIME UNITS IN TELEPHONY

By Franklin B. Wright

Pacific Telephone and Telegraph Co., San Francisco, California

IT IS difficult for any business man to visualize adequately the gain in efficiency and smoothness of operation which would result from the proposed simplification of the calendar. The gain would be made up of many small improvements, whose cumulative effect would be enormous, particularly in an organization as large and complex as that of the telephone industry.

Irregularities in the calendar cause more or less confusion in all activities depending directly or indirectly upon it. Many calendar rearrangements have been proposed from time to time for correcting these deficiencies. The plan known in this country as The World Calendar has lately received such strong support from governments and prominent organizations throughout the world, that its adoption begins to appear probable in the not distant future. For this reason, there is some importance to an examination of the operations of a large telephone organization as they are affected by the calendar, and to an inquiry as to whether a change to The World Calendar would be desirable from this viewpoint.

The function of the telephone business is to provide service, mainly in the form of telephone calls. For each call an individual *voice channel* must be arranged. It is essential that each of these be set up without delay whenever and wherever anyone wishes to make a call. These obvious facts at once indicate the importance of knowing beforehand what volume of traffic to expect in order to have an adequate but not excessive force on hand to take care of the load. Therefore the accurate prediction of *work load* is an element of significance in the successful conduct of the business.

The *volume of work* associated with the original establishment of telephone service also needs to be anticipated with reasonable accuracy in the

NOTE—Now that public opinion is crystallizing definitely in favor of the 12-month equal-quarter World Calendar, the question arises as to how and when the change will be brought about. It has been suggested that the change should be made at the beginning of a year which starts with Sunday, in order to avoid disturbing the sequence of days of the week at the time when the change occurs. The year 1939 is such a year and there is not another one like it until 1950.

Apparently it has escaped general notice that the change could also be made quite conveniently with the end of any year which, under the present calendar, *ends* on Sunday. There are two such years before 1950, namely 1939 and 1944. Both of these years are precisely the same as the proposed World Calendar during the period from September 1 to December 30 inclusive. The new calendar could be made effective on December 31 by calling that day "Year-End Day" instead of Sunday. Then Sunday, January 1, under the new calendar would follow as a matter of course.

Inauguration of The World Calendar in this manner would have at least one point of merit. The world would have four months (September 1 to December 30) to become accustomed to the new calendar through actual experience before the change took place officially, because both the old and the new calendars are identical during this period.

It is obviously desirable to make the new calendar effective at the earliest practicable date. To this end it would appear that proposed treaties to bring this about might well include a list of suitable dates, with the proviso that The World Calendar would become effective on the first of these dates occurring after ratification by a sufficient number of nations. Such a list of dates presumably should include at least January 1, 1939; December 31, 1939; December 31, 1944; and January 1, 1950.—F. B. W.

interest of efficiency and good service. When a prospective customer makes application for the installation of service, an elaborate chain of events is set in motion affecting the activities of many departments. A telephone number, a pair of wires in a cable leading from the central office to a terminal near the customer's premises, and suitable facilities within the central office must be assigned and properly recorded. Individual records of the service must be established for the business office, revenue accounting office, directory department, information department, intercepting and repair services. Telephone equipment and wiring must be installed and connected with the cable plant, and corresponding wires must be run in the central office to complete the connections for the customer's line. These and other related operations, broadly classified under the term *service order work,* must be performed promptly and in proper sequence. Because of the individual nature of telephone service and of the facilities needed to furnish it, *service order work* occupies an important place among the business operations.

It will be readily appreciated that *traffic load* and *service order work load,* as well as many other factors having to do with telephone operations, will vary with predictable regularity to an extent consistent with the degree of regularity present in the lives and activities of the people. There are characteristic differences between the various days of the week and between the various days of the month. But in many instances these differences are ill defined and difficult to analyze with satisfactory accuracy, because there is no fixed relationship between weekdays and month-days.

Consider for example the work of installing telephones. The *work load* rises to a pronounced peak near the beginning of each month, but a month beginning on a day near the middle of the week differs considerably from one beginning say on Saturday. In the latter event part of the peak is likely to be thrown back into the last few days of the preceding month, making the total load unusually large in that month and unusually small in the current month. The historical results for corresponding months of previous years are not so useful as they should be as a basis for prediction, because years with a similar arrangement of weekdays only recur at five-year or longer intervals.

Difficulties of this sort would disappear completely if a perpetual calendar such as the proposed World Calendar were adopted. The term *perpetual* implies that any given monthly date always falls on the same day of the week, year after year. Undoubtedly the most important modification needed in the calendar is some change which will make it perpetual. This is accomplished in The World Calendar by the device of substituting *Year-End Day* for December 31 in the present calendar, and by similar treatment of an extra day called *Leap-Year Day* to be inserted at the end of June in place of February 29 in the present calendar. It is expected that both of these days will be international holidays, Year-End Day pre-

ceding the present New Year's Day as a holiday. The year would start always with Sunday. Exactly 52 weeks would be completed on December 30, which would, therefore, fall on Saturday. The next day would be Year-End Day, an extra Saturday which would be followed by Sunday, January 1, starting off another year—and so on perpetually.

The possibility of obtaining more accurate predictions through the adoption of a perpetual calendar has been stressed, but quite apart from the element of prediction, statistical results are important in order to understand current tendencies in the industry. Nearly all results are subject to seasonal variations of one sort or another. If the calendar were made perpetual these variations would become more clearly defined, and could be counted on to recur in much the same way year after year.

This point may be illustrated by again considering telephone installation work. The *work load* is exceedingly heavy during September, especially near the beginning of the month when the vacation season ends. Now a revision of the calendar which would make September identical with August both as to length of month and arrangement of days of the week would not in general make the *work loads* the same in the two months. The proposed World Calendar arrangement would be just as satisfactory. It makes each of these two months 30 days long, with August 1 falling on Wednesday and September 1 falling on Friday. Labor Day would always fall on September 4. Opening dates for schools and other fall activities would be stabilized, tending to make the ratio of September to August *work load* always the same within narrow limits. If in any given year some change in underlying conditions altered this ratio, this fact would immediately be evident, whereas with the present calendar several months might elapse before the change revealed itself. This is all that any plan of revision can be expected to do, and it is just what is needed.

So far the discussion has dealt with the statistical phases of the calendar reform question. But there is another aspect relating to the day-by-day details of conducting the business. In any highly organized industry such as the telephone business, there is necessarily much work of a periodic nature which is dependent on the monthly cycle. Many detailed records must be maintained and summarized, customers must be billed for services rendered, many monthly and quarterly reports must be compiled, pay checks must be prepared and distributed.

The World Calendar divides the 52 weeks of the year into four equal quarters of three months each. The first month begins on Sunday and contains 31 days, the second begins on Wednesday and contains 30 days, and the third begins on Friday and also contains 30 days. Each quarter repeats this cycle precisely like the other quarters, and every month of the year contains 26 weekdays. This simple arrangement would facilitate the programming of all periodic work which depends on the monthly

cycle, and the experience during each quarter would serve to perfect the program during succeeding quarters. It would not be long before the calendar, and in many cases the program too, would become as familiar as the multiplication table. Printed calendars would soon be relegated to school books for the children to learn once and for all, and would never need to be referred to again.

The only other proposal for revising the calendar that needs to be considered is one that is made perpetual in the same manner as The World Calendar, but differs from the latter in the arrangement of months. The *13-Month Calendar*, as it is called, divides the 52 weeks of the year into 13 months of exactly four weeks each. The simplicity of this arrangement is commendable, but it should be remembered in comparing the proposed plans that the occurrence of holidays and other seasonal activities makes it impossible to design any calendar for which successive months can be considered to be truly alike in a business sense.

Aside from the impracticality of getting any large proportion of the nations to agree on so radical a change from the present calendar, there are two objectionable features in the 13-month plan which are important from the viewpoint of the telephone industry. The cost of performing all monthly tasks 13 times a year would inevitably be greater than doing them 12 times. Also the advantages of reviewing results on a quarterly or semi-annual basis would be lost. There would be no satisfactory way of subdividing the year except by months. Quarterly comparisons especially have demonstrated their value through many years of experience, and should not be discarded without very good reason. These objectionable features of the 13-month plan appear to far outweigh any slight gain in simplicity.

The World Calendar, therefore, promises to be eminently satisfactory for the needs of the telephone industry. It has important advantages and no objectionable features compared with the present calendar. Not only does it include the essential perpetual feature, but it retains and at the same time perfects and simplifies the division of the year into 12 months. Moreover, the proposed symmetrical arrangement of months in precisely similar quarters is accomplished by changes which are so slight as to be scarcely noticeable to the average person.

LIFE UNDER JAPANESE CALENDAR

By Irene Russell Wigglesworth

(From an article in *The Gibbsonian*, New York)

AMONG the paradoxes of life in Japan, not the least has to do with the calendar. We are now in the year 2958, dating from the beginning of the Empire; in the 13th Year of Showa, figuring from the beginning of the present Emperor's reign, and in the Year of the Tiger, by the Zodiac. Children automatically become a year old at birth, and one year older on the following January first. If a child born in December he is, in January, two years old, although he has been on earth only a month.

TIME THROUGH THE AGES

By Arthur M. Harding

Professor of Mathematics, University of Arkansas

This is the last of a series of articles on the scientific backgrounds of man's system of measuring time. The writer is a distinguished member of the American Mathematical Society, the American Astronomical Society and the American Association for the Advancement of Science. He is the author of the most popular textbook on astronomy which has been published in many years.

CHRISTMAS is a festival season with special significances to any student of the calendar. It has its origin in the sun, which to primitive man was the most important of all the heavenly bodies, being the source of light and heat, and probably responsible for life itself.

The most important festivals of prehistoric times were sun-festivals, one in midsummer and the other in midwinter. Christmas comes at the time of the midwinter sun festival. To primitive man mid-December was an important and critical period. The days had been getting shorter and shorter, and the nights longer and longer. The sun was weak and seemed to be very far away from those who lived in the Northern Hemisphere. People lighted great bonfires of logs in order to give the sun strength and bring him back to life again. Of course their efforts were always crowned with success. They soon noticed that the days were growing longer and they rejoiced because the sun had been reborn and was coming back toward them in all glory and splendor. They naturally celebrated this day as a festival representing the new birth of the sun.

We find traces of this sun-festival among the Egyptians, the Chinese and many other peoples. One of the principal Roman festivals was dedicated to the sun-god and was held on December 25 which, in the time of Julius Caesar, was the shortest day of the year and the day of the Winter Solstice. On account of the shift of the seasons, our shortest day is now December 22 instead of December 25.

The date of the birthday festival of the Persian sun-god Mithras, was a very important one to the people of many nations. Everywhere elaborate preparations were made so that December 25—the birthday of Mithras—might be celebrated in the proper manner. In fact, sun worship was at one time so popular and practiced by so many people that there was a serious question as to whether Christianity or Mithraism would finally prevail.

When the Fathers of the Church decided to fix a date to celebrate the birth of Christ, they very wisely chose that day which was so firmly fixed in the minds of the people and was already probably the most important one in their calendar. And so we see that the exact date of Christmas was fixed by the sun.

In this connection it may be interesting to note that when the Puritans were in power in England, an act was passed by Parliament forbidding any religious service or merrymaking on Christmas Day on the ground that it was a pagan festival. This act was not repealed until the time of Charles Second.

Of course the exact date of the birth of Christ is unknown, but that fact makes little difference. In 340 A.D. the Fathers of the Church set aside December 25 as a

religious festival in memory of the birth of Christ and from that day to this, Christmas has been celebrated by special religious services, by the exchange of gifts, and by charitable deeds.

Many of the customs connected with Christmas have originated from the old pagan midwinter sun-festival, which was always celebrated by eating, dancing and drinking. In fact intoxicating liquors played a very important part in ancient worship, and by most early peoples, the state of intoxication was considered sacred. A special drink was prepared for the midwinter sun-festival and even today in Europe we hear of the Wassail Bowl or the Loving Bowl from which this special drink was served. The custom of serving egg-nog at Christmas time still exists in America and we make use of the Loving Cup, although not for the purpose of mixing drinks.

From earliest times the women have baked cakes to be eaten at the time of the sun-festival. These cakes were supposed to contain some of everything that had been raised on the farm during the year. This was probably the origin of our Christmas fruit cakes and plum puddings.

In many heathen countries the sun-festival was called "Yule" from a word which means "sun." We still burn the Yule Log. The ancients built great fires to guide the sun-god back to life. We light candles and put them in our windows so that they may be seen from a distance. The Romans celebrated the great festival of the sun-god by eating and drinking and making merry and giving presents to their friends, a custom which has been observed through the ages.

The evergreen Christmas-tree and mistletoe which were symbols of everlasting life were very closely connected with the ancient sun-festival. With the introduction of Christianity, Christmas became a festival for children and the gifts that had been given to the sun-god were now given to them. Santa Claus took the place of Old Nickel, who was supposed to beat the farmers who had not properly cultivated their fields. The custom of placing candles on the Christmas-tree, which probably originated in the 16th century in Holland, and that of sending Christmas cards to our friends, which is of very recent origin, are about the only customs connected with Christmas that were not carried over from the original sun-festival.

Modern man goes about his daily affairs paying little attention to the sun, unless he happens to be engaged in agriculture, and apparently ignorant of the existence of either moon or stars. He lives by a calendar that is based upon the motions of the heavenly bodies and he meets his appointments by standard time which is daily checked with the stars. He may be dimly conscious that nature is playing her part in his daily routine, but why should he worry? He has the word of Egyptian science-priests, of a Roman Emperor and of a Catholic Pope that his calendar is approximately correct and he is willing to depend upon the astronomers to regulate the clocks so that the commerce of the world may be carried on in an orderly manner.

With early man, who had no clock and no printed calendar, the calculation of the exact date of the beginning of the different seasons was a very important and very serious task, so important in fact that special priests were frequently employed for this purpose. Everything was regulated by the changing appearance of the heavens and annual festivals, such as New Year's Day, Christmas, Hallowe'en, Lady's Day, May Day, St. John's Day and Easter, were celebrated when different heavenly bodies occupied certain positions in the sky, without any reference to the day of the month or of the year. Elaborate sun-temples and star-temples were erected and oriented in such a way that the priests could accurately determine when any season began. After the adoption of a fixed calendar these festivals, with the exception of Easter which is still regulated by the moon, were assigned to certain definite calendar days and no more attention was paid to the sun, moon and stars.

As we have said, the most important festivals of prehistoric times were naturally sun-festivals. The dates of these festivals were not determined by reference to a calendar, for there were no calendars in those days. The passage of the sun through the 12 signs of the Zodiac was carefully observed and a sun-festival was held when it reached each of the four cardinal points of the sky—the Vernal Equinox, the Sum-

mer Solstice, the Autumnal Equinox, and the Winter Solstice. Observance was general.

At the time of the adoption of the Julian calendar the sun passed through these points about March 25, June 25, September 25 and December 25. Consequently, when man shifted from nature's sky-calendar to a fixed man-made device these four days became the most important ones in the year. They no longer register the passage of the sun through the four cardinal points of the sky, but they continue to fix the dates of our principal festivals.

Primitive peoples watched the sun rise every morning and they could not fail to notice that it moved north and south along the eastern horizon and this motion was reversed twice each year—at the time of the Summer Solstice and at the time of the Winter Solstice.

As the sun makes its annual journey through the 12 signs of the Zodiac it crosses the equator moving northward about March 21 and vegetation in the Northern Hemisphere begins to respond to its life-giving rays. Mercury again leads Proserpina back to the earth on her annual return from Hades, and the flowers bloom along the way. Each succeeding dawn finds the sun a little farther in the north and nature rejoices because of the fact that more and more solar light and heat are being lavished upon her. The days become longer and longer until near the end of June, when the sun reaches its farthest position north of the equator—a position of power and strength which primitive man symbolized by the Sign of Leo (the Lion)—and starts back on its journey toward the equator.

At this time of the year many early peoples celebrated a great sun-festival. We learn that in Ireland huge bonfires were built on the tops of the hills similar to the Baal fires of the sun-worshippers. These sacred fires were supposed to have been fed by the sun-god who was also the god of medicine, and by running through them, one could easily rid himself of disease. Animals were frequently driven through them and little children were lifted across the glowing embers. A similar festival was held in Wales, in England, in Scandinavia, and in many other countries. The historic monument, now known as Stonehenge, which was erected on Salisbury Plain in England about 1680 B.C., was probably used for the exact determination of the date of this great sun-festival. In Egypt this sun-festival at midsummer was celebrated as New Year's Day and was the most important festival of the year.

A slow shift in the seasons has advanced this date from June 25 to June 22 since the adoption of the Julian calendar, and at the time of the introduction of Christianity into England it must have been about June 24. At any rate, this date was selected for St. John's Day and in some countries bonfires are still lighted on that day. When the American people began to celebrate Independence Day great bonfires were built as a part of this celebration probably because of their recollection of St. John's festival which had always been celebrated in England at about this time of the year. It was not until a later date that fireworks were substituted for bonfires.

The most important sun-festivals of early times occurred in midsummer and midwinter when the sun was at the Summer Solstice and Winter Solstice, but there were other seasons when festivals having distinct solar characteristics were celebrated. Many early nations had a spring festival at the Vernal Equinox, which at the time of the adoption of the Julian calendar, was March 25. In England this date, which later became known as Lady's Day, was of such importance that it was used to announce the beginning of a new year. Thus the day after March 24, 1620, was March 25, 1621. New Year's Day in England was not shifted from March 25 to January 1 until the adoption of the Gregorian calendar in 1752.

May Day, as the first day of May is called, is celebrated in many parts of the world with dances around the May-pole and other out-of-door festivities. Here again is a festival that has been celebrated since very earliest times. The ancient Irish held a great festival on the first of May in honor of the sun and on this same day the Druids lighted the fires of Baal, the sun-god.

One of the extra months which Numa Pompilius added to the Roman calendar about 700 B. C. carried the name Februalia (purification) because of the pagan festival of Purification that was held on the second day of that month. The Fathers of the

Church later selected this same date (February 2) for the festival of Candlemas to commemorate the Purification of the Virgin Mary. This ancient pagan festival was a very important one, and was always celebrated out of doors and accompanied by many athletic events. Thus the condition of the weather on February 2 has always been of the greatest importance, which probably explains the origin of Ground-Hog Day.

To many people there is no surer way of predicting the arrival of spring than by considering the action of the ground-hog on February 2, when this little animal digs his way out of his winter home and makes a study of the weather. If the day happens to be clear so that his shadow is visible, it is a sure sign that winter is not yet over and that there will be six more weeks of bad weather. The little animal then goes back into his burrow to escape the frost and cold. If the day is cloudy, he knows that spring will soon be here and that it is not necessary for him to go back under the ground.

We shall now consider a very important ancient festival whose date was determined, not by the sun, but by the stars. Why do we celebrate Hallowe'en? When and by whom was it first celebrated? What is the origin of the curious customs connected with it? Why do the spirits "walk" on Hallowe'en?

The answers to these questions are furnished by the ancient science of astronomy, which regulated all calendars and festivals by means of the stars. This festival was celebrated by ancient peoples at a time when the stars, by their slow rotation around the poles, formed the only clock in existence and, by their daily shift with reference to the sun, fixed the seasons and the calendar.

The search for the origin of Hallowe'en goes back to the very beginning of civilization; back to the period when our ancestors had nothing to do but to look after their flocks and herds during the day and study the stars at night. The festival of Hallowe'en was intimately connected with astronomy and the date of its celebration was determined by the stars.

One of the chief hunters of ancient times was Orion, the son of Neptune. One day this handsome giant met the seven nymphs of Diana in the forest and immediately pursued them. Knowing that he would soon overtake them, they called upon the gods for help and were changed into seven snow white doves. Quickly they flew into the sky and were then transformed into seven bright stars which now form the group called the Pleiades. The ancients thus explained the existence of that compact group of stars which was used to fix the date of the celebration of the festival of Hallowe'en.

In November the Pleiades may be seen early in the evening in the eastern sky a little north of east. Today we can see only six stars in this group. The ancients also noticed this and their poets tell us that when the city of Troy fell all seven of the stars paled with grief and one of them, Electra, whose son had founded that city, disappeared altogether.

When the Pleiades had been transformed into a cluster of stars they attracted the attention of everyone. Owing to their prominent position in the sky many ancient peoples regulated their calendars by them, fixing the time of some of their festivals in such a way that they would always occur when the Pleiades were in a certain position in the sky at sunset. So the Pleiades have left more marks on the records of ancient nations than any other heavenly body with the possible exception of the sun and the moon, with which they are very closely associated in ancient legends.

The literature of every nation contains frequent references to the Pleiades, so well described by Tennyson in *Locksley Hall:*

> "Many a night I saw the Pleiads, rising thro' the yellow shade,
> Glitter like a swarm of fire-flies tangled in a silver braid."

Among the records of many ancient nations there are traces of a New Year's festival which was held when the Pleiades were on the meridian at midnight. As this happens in the month of November it is a little hard at first to see how this festival could be associated with New Year's Day. But the month of November is near the beginning of spring in the Southern Hemisphere and no doubt the custom originated south of the equator and was later introduced into the Northern Hemisphere.

A festival regulated by the Pleiades seems to have been one of the most universal of all customs. Although the date of its occurrence has slightly changed, we can trace it from one country to another by keeping in mind the rites that were connected with it. The Festival of the Pleiades has four peculiar features by means of which it may be easily recognized, although the first one will naturally not be very prominent among the races north of the equator: It was (1) a New Year's festival which (2) began at sunset, (3) continued for three days, and (4) was connected in some way with the dead.

In Flammarion's *Astronomical Myths* are cited many traces of the Festival of the Pleiades among the different nations of the world. The Australian savages held a New Year's *corroboree* at the midnight culmination of the Pleiades. This festival, which occurred in November, commenced in the evening and lasted three days.

Among the Society Islanders New Year's Day occurred in November, at the time of the rising of the Pleiades at sunset. The people of Peru held a New Year's festival near the beginning of November.

The inhabitants of the Tonga Islands celebrated the festival of Inachi near the end of October. This festival began at sunset and was in memory of the dead. The first month of the Hindu year was called Cartigney, which is their word for Pleiades. On the 17th day of this month they celebrated the Durga, a festival of the dead.

The Egyptian name for November was Athor, derived from their name for the Pleiades. They continually altered their calendar so as to make the Pleiades culminate at midnight on the 17th of this month. The solemn festival of Isis, which was celebrated for three days in honor of the dead, began on that date. It was then that the priest placed the image of Osiris in a sacred ark and launched it out into the sea.

In the Jewish calendar the 17th of November was also a rather important date, for we read in the Mosaic account of the flood that Noah and his family got into the ark and the flood commenced on the 17th day of the second month. The fact that the Egyptian priest placed a sacred ark on the sea during the festival of Isis makes this coincidence all the more striking.

Let us now examine our own calendar and see whether we of the 20th century are not celebrating this pagan festival, which was formerly regulated by the midnight culmination of the Pleiades and was considered of sufficient importance to usher in the Biblical Deluge. Our festival does not occur on the 17th of November because of the slow drift of the constellations with reference to the calendar, but that is a matter of minor importance here.

Do we not hold a three-day festival in memory of the dead, beginning on the evening of October 31? The night of October 31 is Hallowe'en, November 1 is All Saints' Day, and November 2 is All Souls' Day. To what extent does this three-day festival resemble the festival of the Pleiades? Like the ancient festival of the Pleiades it begins in the evening. Hallowe'en is not exactly a festival of the dead; it is merely the beginning of such a festival. On this night supernatural influences prevail. Not only do the spirits of the dead go about in the land, but also the spirits of the living.

Hallowe'en—Holy Eve—derived its name from the fact that it is the eve of the Christian festival of All Saints which has replaced the festival of All Spirits' Day, celebrated by the pagans ages ago. At this time both good and evil spirits were believed to visit the earth and this was a night for witches, ghosts and fairies, and for pranks of all kinds. All Saints' Day was first celebrated as a Christian festival by Pope Boniface IV in 835. On the 1st of November of that year the Roman Pantheon was dedicated as a Christian temple and this day was set aside to commemorate all of the saints. Some time in the eleventh century the Roman Catholic Church set aside the 2nd of November as All Souls' Day, a festival for the relief of the souls in Purgatory.

Thus we see that Hallowe'en is merely the first day of a festival which begins in the evening, lasts three days, and is in memory of the dead. Since it occurs at the beginning of November it must be the same as the festival of the Pleiades which has been celebrated for thousands of years.

RECENT CALENDAR RESEARCH

Improvement Needed

By Abbe Chauve-Bertrand

French Roman Catholic Authority on Calendar Reform, in *La Jeunesse Ouvriere,* Paris

MEASUREMENT of time dominates the whole present organization of work. Outside of time-tables, contracts, charters and the affairs of corporate and syndicate groups, or national and international assemblies, rises the general determination of the use of time, the attribution of the days—to work, to rest, for leisure, for festivals, for reunions.

The calendar is not just a table of figures and dates, well organized and well understood: it has the more lofty destination of furnishing useful instruction in the management of life. That is why it is a fundamental institution of humanity: there existed even in the most ancient civilizations some rudimentary outlines of its primitive forms.

Our present calendar, in spite of the repeated adjustments which have been made in the course of past centuries, is still afflicted with certain defects, some of which have gradually become grave enough to merit serious study with a view to remedying them.

It is not a question merely of getting a universal calendar, accepted and used by all nations—because the Gregorian calendar, after hundreds of years, has pretty nearly achieved that universality. It is used by the whole world, with the exception of a few parts of Soviet Russia and certain groups of Eastern Christians who cling to the Julian year as a matter of tradition.

It is a question, rather of two phases that need revision—first, the continual overlapping of the days of the week upon the days of the month; and, second, the lunar variation of the date of Easter.

Take Point No. 1. All the world is aware that when January 1 falls on a Sunday, then the following year it is a Monday (or even a Tuesday if the preceding year has been a Leap Year). After New Year's Day, there follows a similar variation in the pattern of the weekdays, throughout the year. No two successive years are alike. A given holiday falls this year on Wednesday, next year on Thursday or Friday, and this varying incidence causes all sorts of inconveniences. If it always came on Wednesday or Friday, it could be planned for and arranged. And that's what I would like to see!

In localities where fairs or markets are arranged on such and such a Thursday of each month, sometimes these days coincide with a great feast day. In localities where fairs or markets are set down for the 10th or the 20th of the month, these dates far too frequently fall on Sunday, with resultant inconveniences. Yes, this variable calendar of ours causes us a lot of trouble in many ways.

As for our capricious Easter, the facts are too well known to need comment. Here the calendar variations are so extensive that they cause all sorts of upsetting complications to religion, business, education and transportation.

For some 50 years, these matters have engaged the earnest study and attention of an ever-widening group of leaders. Beginning more than 100 years ago, in fact, efforts have been made to contrive a more regular and more convenient calendar. The various proposals have been examined from time to time by governments, and also by scientific, educational and commercial organizations. The Holy See, at first reserved, began to follow these developments with keen interest, although it still has made no decision on the subject.

The plan of calendar reform which has finally received general approval and agreement is that known as The World Calendar. This plan, without any serious upheaval, stabilizes the year and makes the calendar invariable and perpetual.

With the progress that has been made, there is no great obstacle left, except inertia. The world is reluctant to change. But this reluctance is unjustified.

For the human race, if it is to progress finds itself obligated to revise, from time to time, many traditional institutions. They become inadequate and insufficient.

That is the case with the calendar. To maintain that a traditional usage ought to remain inviolably immovable, would be to condemn all the improvement that has been accomplished during past ages. It

would be to condemn the reforms of Julius Caesar and Pope Gregory. It would be to say that we were wrong in replacing the ancient stagecoach with the automobile, the hour-glass with the clock, the oil lamp with the electric bulb.

Don't misunderstand me. Without doubt, an established usage should not be touched without a just motive. But we have that just motive in the case of the calendar, as anyone must instantly admit who examines the antiquated luni-solar method by which we set our Easter date.

I have followed this question for more than 25 years. And I do not fear to say that a reform of the calendar, wise and discreet as the one now proposed, is a definite matter of general public welfare.

Enactment Imminent

By Judson A. Baker
Los Angeles *News*

DO you know, without bothering to look it up, on what day of the week you were born? Could you testify in court that the accident you were in back in 1935 was on December 20; and then support your testimony by pointing out you knew the accident occurred the Friday before Christmas, and the date, therefore, had to be December 20? Few persons, know, offhand, the day of the week on which important holidays, except Easter and Thanksgiving, have fallen in years past. This, calendar revisionists point out, is one fault to be found with the calendar in use in most Christian countries.

This calendar, introduced in most Catholic countries by Pope Gregory XIII's bull of February 24, 1581, will be revised within 10 years, according to sponsors of the latest revision movement.

Agitation for calendar revision is not new. Years before The World Calendar Association proposed this revision in its first formal publicity, June 1, 1931, other groups struggled for adoption of a 13-month calendar. Churches fought adoption of the 13-month calendar, and there seemed no hope for calendar revision in face of the strong church opposition. Religious objections were based on interference with great religious festivals, such as Easter, Thanksgiving and Christmas.

Successful stabilization of those holidays is a feature claimed for the latest revision, and is said to have overcome most of the objections by church groups. Apparent tampering with the seven-day week, in December, long was an objection finally swept aside by educating objectors to a 48-hour Saturday, December 30.

Business and professional groups also objected to the 13-month proposal on grounds 13 is not divisible by any number, and business is operated on a basis of quarterly and semiannual reports.

Under The World Calendar business may conveniently close its books at the end of each quarter, on Saturday. Business may also continue its practice of sending out statements 12 times a year, instead of 13, as would be required under the 13-month calendar.

Another advantage claimed for The World Calendar is that it can be memorized, eliminating the necessity of carrying pocket calendars and of renewing printed calendars each year.

Exclusive of definitely dated holidays, every month contains 26 working days, instead of the variable number contained in months of the present calendar.

"This new calendar has so many advantages it is bound to be adopted," one scientist here declared recently. Among Southern California men actively interested in the change are Dr. Dinsmore Alter, director of Griffith Park Observatory; Dr. E. C. Bower, lecturer at the observatory; Dr. Robert Emerson, California Institute of Technology, and Dr. Hervey C. Parke, prominent clergyman.

Dr. Alter and Dr. Bower predict adoption of the new calendar on one of the "convenient dates" within 12 years.

The "convenient dates" for adoption would be when the last day of the year falls on a Sunday or on a Saturday, making it possible for the new calendar to become effective on a Sunday, January 1, or after a 48-hour Saturday, December 31.

January 1 and December 31 are "convenient dates" in 1939 and 1950, it was pointed out, and 1944 ends on a Sunday and 1956 begins on a Sunday.

Mere agreement of nations, backed up by proclamations issued by heads of their governments, or by resolutions adopted by their legislative bodies, would suffice for adoption of the revised calendar.

CURRENT PRESS COMMENT

Modern Challenge

The American Friend

The long story of the adoption of our present calendar, with its unequal months and its irregular dates and seasons marks the story of blunders, mistakes and superstitions. Science and astronomy have won victories in our present partially perfected calendar. Our challenge is to favor that development along the line that can be built with mathematical precision without any revolutionary approach. We need no startling change, but we should attack the needs of a modern world and seek to develop and work toward that type of a calendar that can have the support of all thinking people.

Lessons of History

Cleveland News

We have been developing our calendar into its present state of inadequacy since the beginning of civilization. The Hebrews started reckoning time with a lunar calendar, measuring time by the moon's behavior. Egyptians invented their own system, based on sun and stars. This is the one we have been improving.

Devising a calendar is no easy trick. Julius Caesar tried to iron things out; Augustus had a crack at it; so did Pope Gregory. Cautious England delayed in accepting Gregory's changes for 150 years —one consequence of which was that the birthday of a 20-year-old Englishman named George Washington had to be changed from Feb. 11 to Feb. 22.

Now comes The World Calendar with a plan. It has many arguments which impress us.

More Nations Join Up

Waterville (Maine) Sentinel

Governments of China, Turkey, Uruguay and Afganistan have officially declared their approval of The World Calendar, thus joining the Latin-American states, Chile, Brazil, Mexico and Peru, together with a European group of which the governments of Norway, Greece and Spain are most vocal.

Change Coming

South Bend (Ind.) News-Times

That a revision of the present calendar may be expected in the not too distant future is indicated by the increasing number of new governmental and national organizations and important individuals who support the 12-month equal-quarter revision of the present calendar, known in America as The World Calendar.

Not So Far Off

Waterloo (Iowa) Courier

We could make the jump from our present calendar to The World Calendar almost overnight without serious inconvenience.

The movement in support of this change seems to be gaining momentum. The National Education Association, after a year of careful study by a special committee, recently passed a resolution recommending its use. The American Philosophical Society, the Mathematical Association, the American Academy of Arts and Sciences, the Institute of Radio Engineers, and the American Association for the Advancement of Science have all passed resolutions favoring The World Calendar.

In fact, the calendar "revolution" may not be as far in the offing as we had supposed.

Making Progress

Bismarck (N. D.) Tribune

Get ready for a change in the calendar now commonly used. The World Calendar is making progress. Fourteen nations have signified their desire for a change. Popular agitation is increasing. Most significant is the support of churchmen—Protestant, Catholic and Jew. This is important, because the present calendar had religious origins. It represented a great religious advancement as well as a monumental work in mathematics. It was the work of a churchman, Pope Gregory XIII.

Industry and business favor the change. It will make things easier for them. The great mass of the people would favor it for the same reason.

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ELISABETH ACHELIS, *President*

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DURING the anxious month of September, when Europe and America were torn with the apprehension of another world war, one thing was clear. It was the universal desire for peace—if peace could be achieved. "No one who lived through the grave hours of the last month," said President Roosevelt, "can doubt the longing of most of the people of the world for enduring peace. Our business now is to utilize the desire for peace, to build principles which are the only basis for permanent peace." As the President intimated, man must do something about peace instead of merely discussing it. Words without deeds are dead.

What is needed is to demonstrate that nations can sit down around a common council table and agree on at least one project for human betterment.

Calendar reform is such a vehicle for world peace. It is a living force for international agreement and a promise of international amity, on which alone can true peace be based. The World Calendar is here for the use of all nations. It has already received wide enough approval to establish its importance. Fourteen nations have definitely expressed themselves in approval. In this harmonizing calendar, there is unity for the people of the east and the west, the north and the south; for the occidental and the oriental, the practical and the ideal, the Christians and those of other faiths. Here is a new order of time bridging past and present.

So at this, the Christmas season, as all thoughts turn to the eternal message "Peace on earth, good will toward men," the world may well work, in the words of the President's recent peace message, "in a spirit of justice, of fair dealing, and . . . with greater permanence." Not only is The World Calendar a contribution to world unity, stability and order but it provides to an ideal degree the *common ground* of understanding and mutual interest, making for kinship and amity in a varied world. It would bind nations and peoples in a *common bond of time.*

EXCERPTS AND REVIEWS

Necessary for Convenience

By W. T. Hipps
Corsicana, Texas

An Address Before Texas Rotary Club

FOR purposes of definition, a calendar is a method of dividing time into periods adapted to the purposes of civil life.

In the beginning, when Jehovah started the wheels of time to rolling, He created and set in motion certain heavenly bodies which divide time into convenient periods. Two motions of the earth, rotation and revolution, divide time into days and years, while the inclination of the earth's axis causes the division of the year into the four seasons—spring, summer, autumn and winter. The revolution of the moon around the earth divides the years into twelve lunar months.

These are natural divisions of time, or Nature's calendar.

Now, if we may, we shall imagine that Jehovah, when He told Adam and Eve to subdue the earth, presented to His first tenants nature's calendar, and informed them that no further division of time would be necessary for their convenience, or for the convenience of their posterity for many generations to come.

But Jehovah could see down the avenues of time, when the plains and valleys would begin to be thickly populated, when the wants of man would begin to multiply, when the various resources of the earth would begin to be developed, when the resultant industries would begin to stimulate the building of cities, when the social relations of men would begin to be more and more intricate—when all these things should come to pass, the All Wise Creator knew that further division of time would be necessary for the purposes of civil life.

Nature's calendar must now be enlarged by man. Months must be divided into weeks, weeks into days, days into hours, hours into minutes and minutes into seconds. When the racing planes move through space 1000 miles an hour, then the division of the seconds into shorter periods will be a convenience. In the Book of Books I find this phrase: "In a moment, in the twinkling of an eye."

So, in compliance with the demands of a progressive civilization the genius of man began the task of perfecting the calendar. The most difficult part of the work was to arrange a civil calendar that would be in agreement with the solar year. In order to do this the beginning of the year at the same distance from the solstices and the equinoxes must be preserved. This done, the seasons would recur in the proper months every year, and the church festivals, such as Easter, would come in their proper seasons.

The calendar now in use came from Egypt by way of Rome. Clear skies of Egypt lent encouragement in the study of astronomy. The Egyptians had learned, by means of their sun temples, that a solar year was about 365¼ days in length. In trying to arrange a civil calendar they found it difficult to adjust lunar months in solar years. Consequently, disregarding the moon, they divided the year into 12 months of 30 days each. The five extra days in common years and the six extra days in leap years were inserted at the end of each year.

So far as agreement with the solar year and the changing of seasons is concerned, the Gregorian calendar is almost perfect. But further revision in the distribution of days among the months and division of the year into equal parts will give the world a more accurate and stable time system. In the proposed World Calendar these reforms are found.

When Do Centuries Begin?

By H. W. Bearce
National Bureau of Standards, U. S. Department of Commerce, Washington

QUESTION has arisen in correspondence with this office, as to whether January 1, 1900, fell in the 19th or 20th Century. It seems to me there can be no question that 1900 was the closing year of the 19th Century, and that the 20th Century began on January 1, 1901.

I base my opinion on the fact that it takes 100 years to make a century, and that there is no "zero" year. Therefore,

the 100th year, through December 31, must be included to complete the century.

Our correspondent might be able to settle the argument by drawing a chart showing the beginning and the end of a century, and the beginning of the next century. It will, of course, be found that each century will begin with the year "1" and end with the year "100" added to the centuries, A.D., that have preceded it. For example:

1st Century, A.D. 1 to 100, inclusive
2nd Century, A.D. 101 to 200, inclusive
19th Century, A.D. 1801 to 1900, inclusive
20th Century, A.D. 1901 to 2000, inclusive

It seems to me that the same rule applies in designating the century as in expressing the age of a child. The child is not 1 year old until he has lived entirely through the first year. Similarly, the centenarian is not 100 years old until he has lived through the 100th year. Although he is in his 100th year as soon as he has passed the 99-year mark, he does not start on his second century until he is at the beginning of his 101st year. Probably most of us will not have occasion to worry about the second hundred years.

From French Science

By PAUL-LOUIS HERVIER

Address Before the Congress of Chronometry and Meteorology, Paris

PRECEDING me, Prof. Henri Mineur, Astronomer of the Paris Observatory, has given you a complete and clear explanation of calendar reform. I must personally thank Prof. Mineur for having presented the matter so well, because I can limit myself to pointing out the effective progress accomplished in the direction of enacting this change.

The progress has been remarkably rapid during the past two or three years, and gives ground for hoping that realization may come shortly.

Prof. Mineur has described the plan which has met with the approval of governments, namely, The World Calendar. This was the only plan considered by the League of Nations at its latest meeting on this subject. It will interest you, I am sure, if I sum up the most recent developments in international action toward enactment of a revised calendar.

At the 96th Session of the Council of the League of Nations, a communication was brought in, from the International Labor Office, submitting the text of a calendar reform resolution passed by the International Labor Conference. Mr. Edwards, representative of Chile, discussed the importance of this resolution in a lengthy address.

"The first step toward this action," he said, "was a resolution adopted at the Labor Conference of the American States, meeting in Santiago, Chile, which recommended international approval of The World Calendar. This action by the Americas was followed by similar action, passed unanimously, by the 20th Session of the International Labor Conference, which asked the Council of the League of Nations to urge its Commission on Communications to follow very attentively its studies of this question."

Mr. Edwards then proceeded to outline other action taken by other groups and assemblies which, even though of a private character, are none the less influential and powerful.

At the close of his address, Mr. Edwards in the name of his government placed before the League of Nations a draft convention. He emphasized the need for definite and rapid action. It was finally agreed by the Council that the whole question, including the draft treaty, would be submitted to all member and non-member nations for their comment and approval.

I apologize, gentlemen, for having given you, instead of a learned study, a mere statement of informative facts. This information, however, may encourage you at this time to proceed with a motion in support of calendar reform, for which the following text has been suggested:

"WHEREAS, it is to the public interest to conserve the year of 12 months with equal quarters, and

"WHEREAS, the project for calendar reform known as The World Calendar is the only one which can be readily adopted by all nations,

"Be It Resolved, that the Congress on Chronometry recommends that this project be adopted, and

"The Secretary is instructed to file copies of this resolution with the League of Nations, all Chiefs of governments, and the International Chamber of Commerce."

FROM THE MAIL BAG

I believe that there is no single question, the settlement of which would bring about greater cooperation among nations than a common measurement of time.—The Right Hon. Lord Desborough, K.G., Panshanger Park, Hertford, England.

There is no doubt but that a vast amount of energy and time has been lost through our present illogical calendar, which makes a proposal of this character one with which every intelligent man should agree. Anyone who knows the history of our calendar should realize that there is no sanctity in our present arrangements, even though there may be antiquity.—R. G. Sproul, Pres., Univ. of California.

Desirability of a permanent calendar seems so obvious that I am surprised at the large amount of first-step argument. The 13-month and decimal calendars would be impossible to live with.—Henry Paul Busch, Philadelphia.

I am sincerely interested in the success of the reform you are advocating.—Julius F. Stone, Columbus, Ohio.

For the past five years I have preached a sermon on the last Sunday of every year, using for my topic, "The Touch of Time." I have found a deep interest in the subject of calendar reform that is not second to any other theme.—Dr. R. M. Pratt, First Unitarian Church. Keokuk, Iowa.

The reform of the calendar is sensible and should have been made before now.—F. E. Farquear, Dean, Univ. of Miss.

Calendar reform seems most desirable. I wish you success in your undertaking.—A. H. Loomis, Pres., Lehigh Harlem River Terminal, N. Y. C.

In 1912 I was a delegate to the international Congress of Chambers of Commerce in Boston, and the question of calendar reform was discussed already then.—Dr. J. Loth, Warsaw.

Heartily in accord with the Association's program.—G. MacCreagh, Centerport, Long Island.

As a strong believer in the revision of our calendar, I am convinced that the 12 months must be retained and think that an equal number of days in each quarter is desirable. The World Calendar is the best solution of the problem.—W. W. Atwood, Pres., Clark Univ., Worcester, Mass.

I have always been in sympathy with any rational uniform time-marking device that would be of universal acceptance.—Dr. W. E. Leonard, Hadley, Mass.

From a statistical point of view, the Dept. of Railways is interested.—W. A. Anderson, Government Railways, Sydney.

I wish to say that at every opportunity that is afforded me, I advocate the 12-month plan of calendar reform.—Prof. George H. Ryden, Univ. of Delaware.

Am very much interested in your movement and think you are doing splendid work in bringing all the facts to light.—C. M. Smith, Ass't Secy., American Institute of Accountants.

Reform of the calendar is necessary and long overdue.—B. V. Jadhav, Bombay.

"The Romance of the Calendar" by P. W. Wilson is a very useful and interesting book and has a lot of information that would be hard to come by anywhere else.—H. S. Leach, Librarian, Lehigh Univ.

I have long been interested in this reform and shall do all I can to help its accomplishment.—C. C. Stoughton, Pres., Wagner Lutheran College, N. Y. C.

Our Merchants Committee has already gone on record, and has been for the past several years in favor of a uniform calendar which is so vital to this particular class of trade.—E. N. Weinbaum, Mgr., Trade and Commerce Dept., Portland, Ore., Chamber of Commerce.

Glad to be identified with the W. C. A.—T. Mann, Ed., "Militant Trade Unionist," Sidcup, England.

So far as I am concerned, I see no objection to the suggested change, but on the other hand, from the standpoint of the schools and colleges, I believe it would be to advantage.—J. A. Burruss, Pres., Virginia Polytechnic Inst., Blacksburg, Va.

It would be a great boon if we might have the revised calendar for 1939.—F. A. Welch, Midland Schools, Des Moines, Ia.

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EDITORIAL PARAGRAPHS

The *Trade Journal* has had much experience with the trouble occasioned by the unevenness of the present calendar, which will be eliminated through its reform.—Stockholm *Affarsvarlden.*

Calendar reform is a duty of intelligence which few of us can ignore.—Hartford (Conn.) *Times.*

It is safe to say that millions now living will live to see 30 days in February and also in March.—Toronto *Bulletin.*

It is historical fact that the Gregorian calendar was developed out of ages of confusion. If confusion is a stimulus to calendar reform, the time seems ripe for Europe, Orient and United States to fall in line.—Syracuse *Herald.*

To many the idea of reforming our present calendar is somewhat of a novelty, but after studying this admirable collection of addresses and occasional papers by the President of The World Calendar Association, one cannot fail to realize that there is a very strong case for a new system based on order and stability.—Nottingham (Eng.) *Journal.*

Astronomers are adding their voices to those of the many people who believe that the so-called World Calendar should supplant the present Gregorian calendar.—Marshfield (Wis.) *News-Herald.*

The World Calendar would facilitate statistical comparison. The transition from the Gregorian to the new calendar could be made without any complications whatever.—Prague *Vesmir.*

Now we find American teachers joining in the movement for simplification of our method of measuring time under the Gregorian calendar.—Newport (R. I.) *News.*

The Chamber of Commerce of The Hague is convinced that The World Calendar is desirable, and, in agreement with the 1931 report of the Neyland Commission, it consents to its introduction.—The Hague *Vorruit.*

Chile was the first nation in Latin America to sanction officially The World Calendar.—Santiago (Chile) *El Mercurio.*

P. W. Wilson in "The Romance of the Calendar," presents a subject of great interest. Simply told and admirably condensed, while giving all the essential facts, the book covers the entire development and significance of the calendar to people of every race from remotest antiquity to the present.—Pasadena (Cal.) *Star-News.*

Within its structure The World Calendar retains enough variety to free it from any charge of being fixed or mechanical.—Toronto *Office Management.*

Anyone who is interested in improving our civilization should be concerned for the success of The World Calendar.—Weston (Mass.) *News.*

It is universally conceded that our present calendar presents certain disadvantages because of its lack of uniformity.—Centreville (Mich.) *Observer.*

An article in favor of the revised calendar has just been published posthumously, from the pen of the late Martin Burrell, the Canadian statesman. Mr. Burrell hoped that The World Calendar might be adopted in 1939.—Toronto *Globe.*

Surely we would not long endure this makeshift calendar if a large number of us were familiar with the fact that a few additional steps in the long history of its evolution would make it almost perfect and perpetual.—Bartow (Fla.) *Record.*

Reasons for a change of calendar are many. We suffer today because of the inadequacies and confusions of our present method of keeping time.—Paterson (N. J.) *News.*

Since The World Calendar has met with general approval in both the laboratories of science and much of the world of commerce, it seems that the time has come for its adoption.—Marinette (Wis.) *Eagle-Star.*

Proposals to discard the present calendar and adopt a new one are gaining favor. Representatives of business have endorsed this change for business reasons; representatives of religious groups hail it as a solution to many of their problems.—Blackfoot (Ida.) *Bulletin.*

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